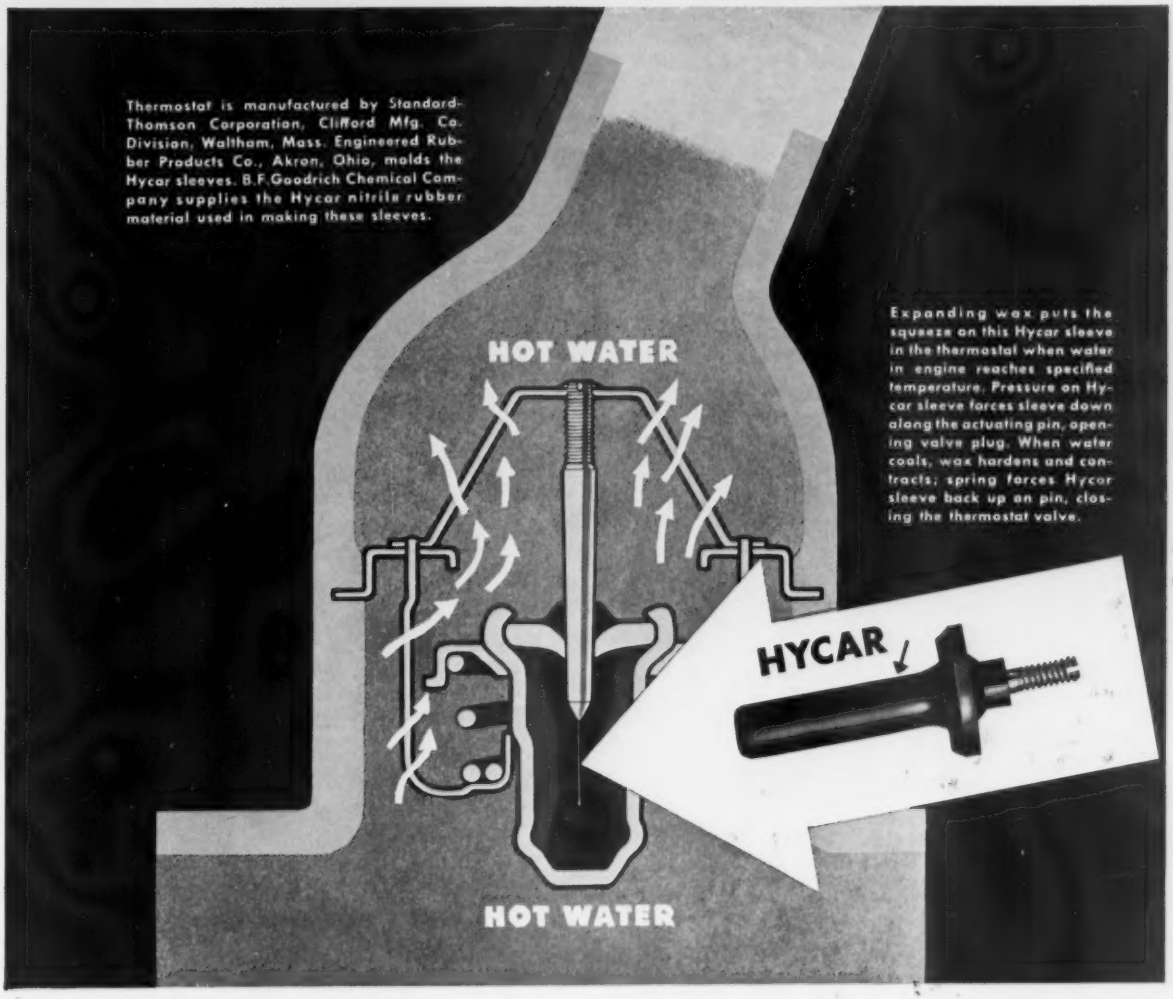
Another new development using

B.F.Goodrich Chemical *raw materials*


Thermostat is manufactured by Standard-Thomson Corporation, Clifford Mfg. Co. Division, Waltham, Mass. Engineered Rubber Products Co., Akron, Ohio, molds the Hycar sleeves. B.F.Goodrich Chemical Company supplies the Hycar nitrile rubber material used in making these sleeves.
HOT WATER
Expanding wax puts the squeeze on this Hycar sleeve in the thermostat when water in engine reaches specified temperature. Pressure on Hycar sleeve forces sleeve down along the actuating pin, opening valve plug. When water cools, wax hardens and contracts; spring forces Hycar sleeve back up on pin, closing the thermostat valve.
HYCAR
HOT WATER

Hycar controls heat of automobile engine operation

A SLEEVE of Hycar nitrile rubber solves a thermostat operating problem of high pressure cooling systems. Hycar is ideal because it is not affected by antifreeze chemicals or heat. It provides flexibility with high strength and exceptional resistance to volume change and abrasion.

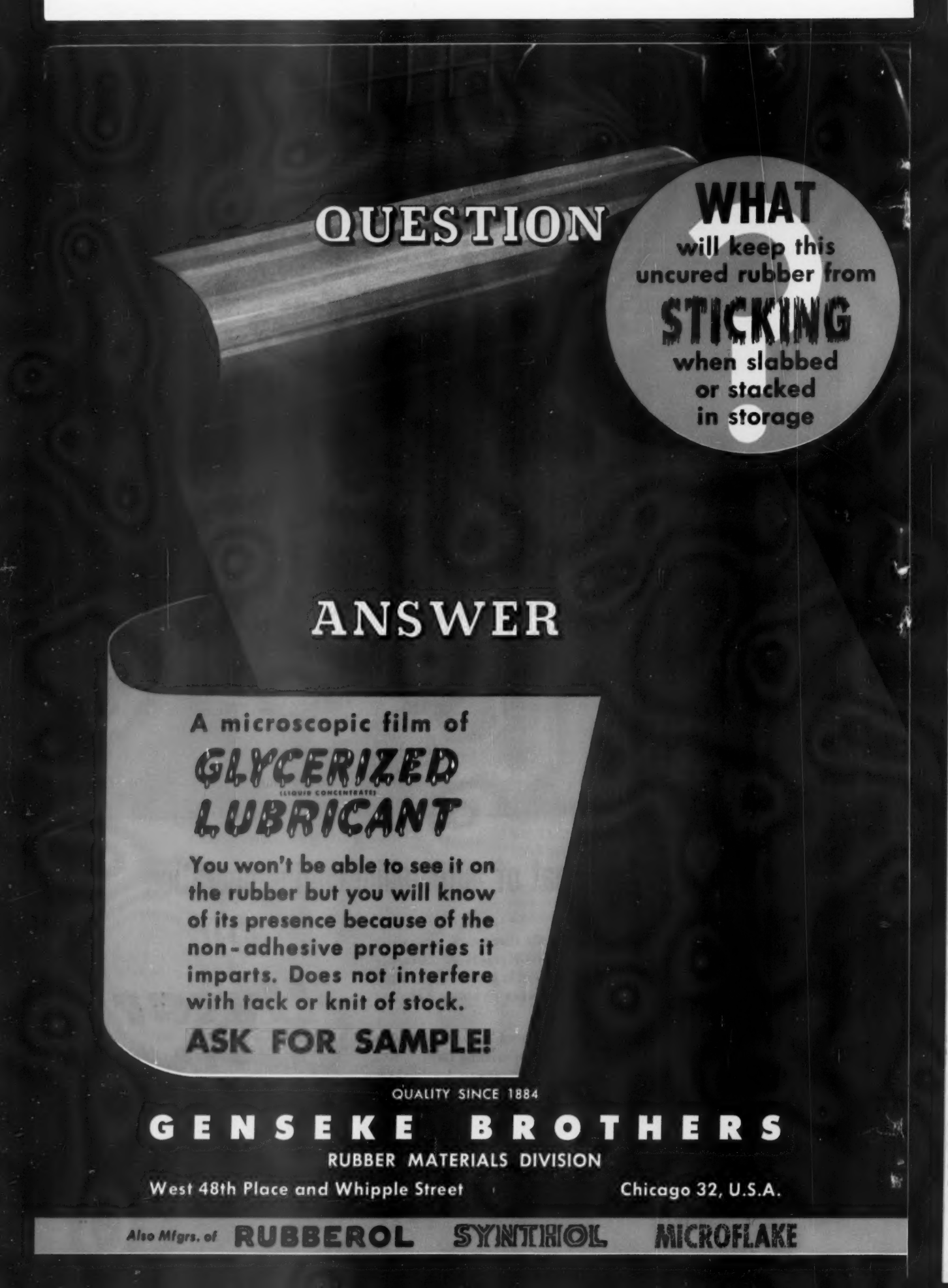
Hycar nitrile rubber makes possible improved existing products and new products, too. Get information on it by writing Dept. KA-12, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

Hycar
American Rubber

B.F.Goodrich Chemical Company
a division of The B.F.Goodrich Company

B.F.Goodrich

GEON polyvinyl materials • HYCAR American rubber and latex
GOOD-RITE chemicals and plasticizers • HARMON colors


QUESTION
WHAT
will keep this
uncured rubber from
STICKING
when slabbed
or stacked
in storage
?
ANSWER
A microscopic film of
GLYCERIZED
(LIQUID CONCENTRATE)
LUBRICANT
You won't be able to see it on the rubber but you will know of its presence because of the non-adhesive properties it imparts. Does not interfere with tack or knit of stock.
ASK FOR SAMPLE!
QUALITY SINCE 1884
GENSEKE BROTHERS
RUBBER MATERIALS DIVISION
West 48th Place and Whipple Street
Chicago 32, U.S.A.
Also Mfgrs. of RUBBEROL SYNTHOL MICROFLAKE

Rubber Age

COVERING THE MANUFACTURE OF RUBBER AND RUBBERLIKE PLASTICS PRODUCTS

DECEMBER, 1958 VOL. 84 NO. 3

Published Monthly by
PALMERTON PUBLISHING CO., INC.
Editorial and Advertising Offices
101 West 31 St., New York 1, N. Y.
Phone: PEnnsylvania 6-6872

P. L. PALMERTON, *President*
M. E. LERNER, *Vice-Pres. & Treas.*
E. D. OSBORN, *Secretary*
CHARLES T. JANSEN, *Asst. Treas.*

PUBLICATION STAFF

Editor and General Manager
M. E. LERNER

Managing Editor
B. J. KOTSHER

Technical Editor
FRED D. MOORE

Assistant Editors
BERNARD M. BERNS
STANLEY HOCHMAN
NANCY T. ROCKWELL

News Correspondents
CARL S. HOGLUND
5107 Telegraph Road,
Los Angeles 22, Calif.
Phone: Angelus 2-8136

PHIL GLANZER
223 Coldstream Ave.
Toronto 12, Ont., Canada
Phone: Hudson 7-2139

Art Director
KENNETH T. CORELL

Production Manager
BARBARA L. MOORE

Circulation Manager
CONSTANCE SAVAGE

Advertising Sales Manager
CHARLES T. JANSEN

Advertising Representatives
ALLEN M. BROWNE
101 West 31st St
New York 1, N. Y.
Phone: Pennsylvania 6-6872

F. ROYAL CAREY
68 Shenandoah Road
Warwick, R. I.
Phone: Turner 4-9624

JIM SUMMERS & ASSOC.
35 East Wacker Drive
Chicago 1, Ill.
Phone: Andover 3-1154

CHRIS DUNKLE & ASSOC.
740 South Western Ave.
Los Angeles 5, Calif.
Phone: Dunkirk 7-6149

420 Market St.
San Francisco 11, Calif.
Phone: Sutter 1-8854

In This Issue

431 **The Colloid Phase Carbon Reinforcement of Rubber**—By H. A. Braendle, G. L. Heller and J. W. White

A study which indicates that by recognizing the time factor in colloidal reactions, a significant improvement in the carbon reinforcement of rubber can be effected.

440 **Ozone Resistance of Butyl Rubber**—By R. F. Grossman and A. C. Bluestein

An investigation into the variables which affect the ozone resistance of butyl rubber.

444 **Advantages of Wooden Pallets for Handling Rubber Products** By William H. Sardo, Jr.

Hints on how wooden pallets can spell savings in the handling and storing of rubber goods.

448 **Behavior of Silicone Rubber in Sealed Systems at High Temperatures**—By W. J. Bobear

An analysis of the effects of choice of fillers and curing agents, with data on curing temperatures and application design.

451 **Absorptiometric Determination of Traces of Copper in Rubber Chemicals and Rubber Products**—By R. C. Madan

Report on a method using zinc dibenzyl dithiocarbamate which is extremely sensitive and time saving.

456 **How Good an Executive Are You?**—By Larston D. Farrar

A Special Industry Report on how managerial personnel in the rubber industry can best fulfill their functions.

Special Reports

Capitol Cues	415	376	News Highlights
Markets	508	426	Overseas

Regular Departments

Book Reviews	502	498	New Equipment
Chemical Prices	514	490	New Goods
Classified Ads	528	488	Obituaries
Coming Events	420	397	On the Continent
Editorial	455	404	Patent Review
Financial News	476	484	West Coast News
Names in the News	474	*	Statistics

*Appears every other month

Microfilm copies of complete volumes of RUBBER AGE are available from University Microfilms, 313 North First St., Ann Arbor, Mich.
Indexed in Industrial Arts Index and Engineering Index

© Palmerton Publishing Co., Inc., 1958

RUBBER AGE is published monthly by the Palmerton Publishing Co., Inc. Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 101 West 31st Street, New York 1, N. Y. Entered as second class matter Oct. 30, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $5.00 a year; Canada, $5.50; Foreign, $6.00. December, 1958. Vol. 84, No. 3.

Highlights Sidelights *of the News . . .*

December, 1958

The 43rd Annual Meeting of the Rubber Manufacturers Association held on November 20 in New York City attracted over 200 members . . . The meeting featured addresses by President Ross R. Ormsby, Vice-President W. J. Sears, Karl O. Nygaard of the Business Research Department, B. F. Goodrich Co., and Jules Backman, professor of economics at New York University . . . Mr. Nygaard predicted a 13 per cent increase in rubber consumption in 1959 (page 458).

Four technical sessions highlighted the Conference on Military Applications of Fabrics for Coating held on October 16 and 17 . . . Sponsored by the Textile Fabrics Committee of the Quartermaster Advisory Board for the National Research Council of the National Academy of Sciences, the meeting was attended by over 250 industry representatives (page 465).

A wide variety of rubberlike plastics products were on display at the Eighth National Plastics Exposition held in Chicago the week of November 21 . . . The exposition was held in conjunction with the Annual Conference of the Society of the Plastics Industry . . . Approximately 25,000 persons visited the exposition (page 468).

A new plant for the manufacture of pressure-sensitive tapes, adhesives and related rubber products has been opened by the Dutch Brand Division of the Johns-Manville Corp. . . . The new plant increases the division's capacity for the production of these products by more than 50 per cent . . . The new facility is the seventh put into operation this year by the company (page 469).

The Government Accounting Office has charged the Firestone Tire & Rubber Co. with making an "unreasonably high rate of profit" on a three-year defense contract . . . The Government charges that Firestone made something like 35 per cent of cost on the manufacture of fuel cells while the company states its actual profits averaged under 11 per cent (page 486).

—Starting This Month—

A new feature . . . "On The Continent" . . . A review of rubber developments on the European Continent . . . Prepared by Felix F. Fluss, a correspondent with many years of experience, the new feature will contain much new and valuable information each month (page 397).

There's a Huber Oil Black for every need

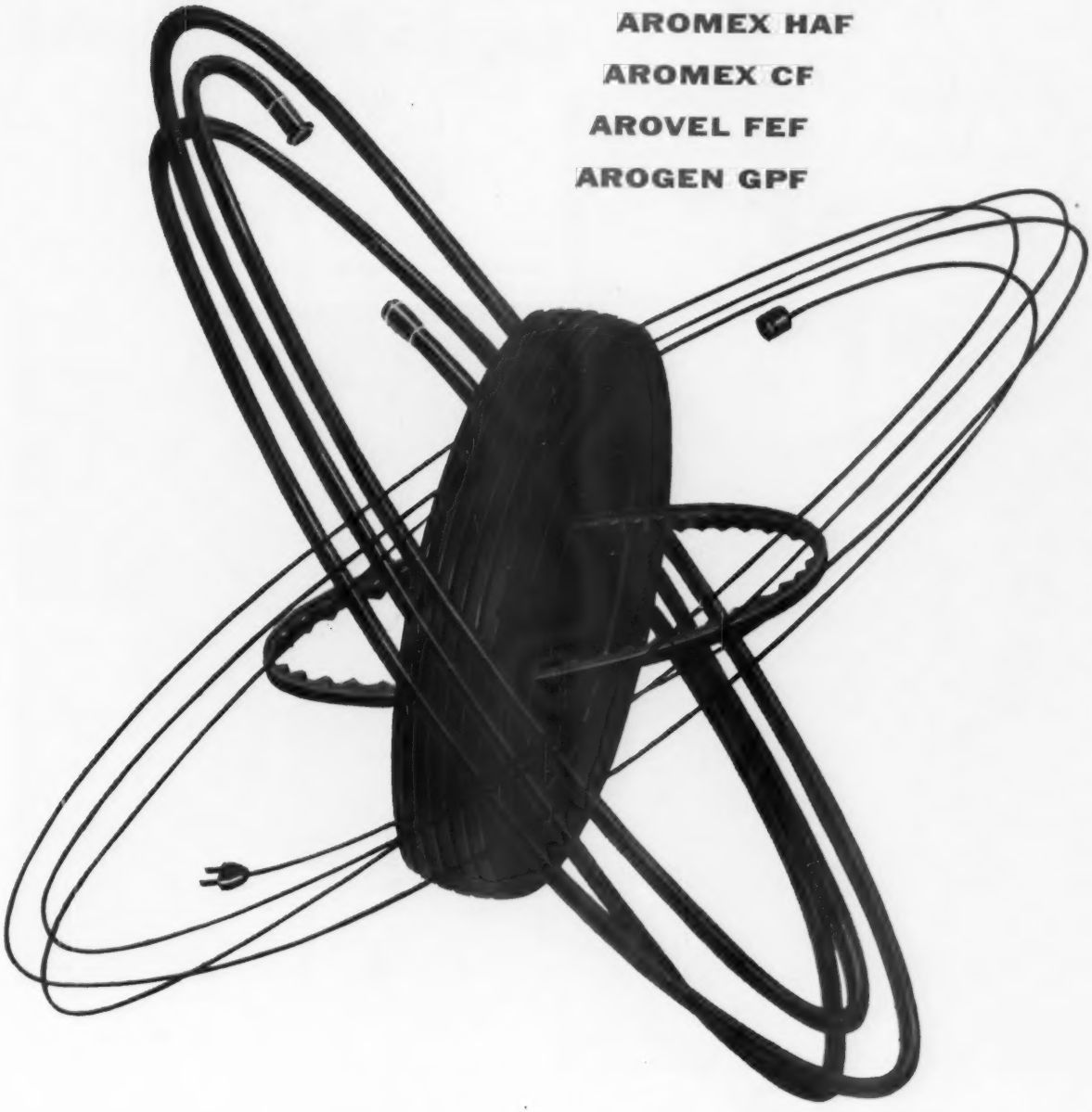
AROMEX ISAF

AROMEX HAF

AROMEX CF

AROVEL FEF

AROGEN GPF



For Rubber Reinforcing Pigments, Think of HUBER

Wise owls read Huber Technical Data. Ask to be put on our mailing list.

J. M. HUBER CORPORATION

100 Park Avenue, New York 17, N. Y.

CARBON BLACKS • CLAYS • RUBBER CHEMICALS

Stacking up profits is easier... when you use Ameripol Rubber

Before: *Ordinary bags have to be unloaded from truck or rail car one by one—takes extra time and manpower, increases costs.*

After: *Ameripol comes in bags with vertical-release glue to permit easy, safe stacking, economical lift truck handling.*

PROFITS go up, handling costs go down when your plant gets Ameripol rubber in bags that can be safely pallet-loaded. As many as 28 bales of rubber may be loaded on a single pallet. Yet when it's time to unload, each bale can be lifted off without damage to the bags.

Improving packaging to cut handling costs is part of the Goodrich-Gulf program to make rubber processing easier and less costly. It includes new product developments to cut your costs. It includes addition of new manufacturing facilities to put vast supplies of raw rubber nearer to you. These are all reasons Ameripol has become—*the preferred rubber*...examples of how your company can profit when you buy from Goodrich-Gulf Chemicals, Inc., 3121 Euclid Avenue, Cleveland 15, Ohio.

Ameripol
THE PREFERRED RUBBER

Goodrich-Gulf Chemicals, Inc.

Vertical Continuous Vulcanizing

. . . a totally new concept in wire insulation

ANNOUNCEMENT TO THE INDUSTRY

Problems of transformation, scuffing, flattening and scoring in the curing of thick, spongy insulation have been eliminated by Vertical CV. Already in commercial use, Davis-Standard Vertical CV machinery delivers cable insulation of better concentricity, more uniform diameter and improved values in dielectric strength and corona level tests.

There are numerous advantages to drawing the insulated wire downward through the vulcanizing tube:

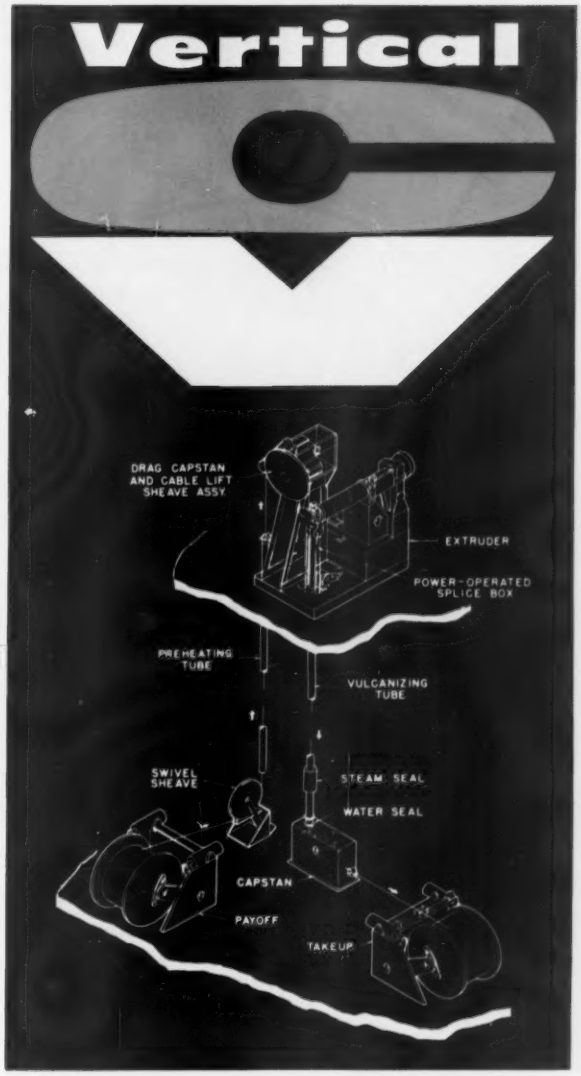
The easily damaged, uncured insulation does not come in contact with the vulcanizing tube until it has been vulcanized by steam and water.

The Drag Capstan, located above the Extruder, can be used to retract wire from the vulcanizing tube.

Vertical CV does not require the valuable floor space occupied by the conventional horizontal vulcanizing process.

Pay-Off, Capstan and Take-Up machinery are located on one floor for convenient reel-handling and operating adjustments.

The desirable feature of pre-heating the wire can be readily accomplished as it travels upward to the extruder.



We are prepared to discuss the application of Davis-Standard's Vertical CV machinery to your wire insulating line.

DAVIS-STANDARD

Division of FRANKLIN RESEARCH CORPORATION

14 WATER STREET, MYSTIC, CONNECTICUT

IN EUROPE AND THE STERLING AREA CONTACT FINNEY PRESSES LTD . BIRMINGHAM, ENGLAND .

MR. CLIMCO SAYS...

LINERETTE PAPER

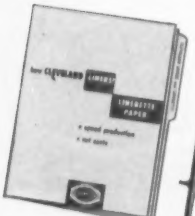
is *ideal* for separating lightweight stocks

In use for over 29 years, Linerette is a quality, specification sheet that provides a quick and easy way to separate stock without adhesion. Linerette preserves the tackiness of the stock and contains no oil or wax which might migrate.

LINERETTE is furnished in any width up to and including 54", in rolls of 9", 11½", 13", and 15" diameters; put up on 3" i. d. cores. The yield is approximately six square yards to the pound. A 9" roll contains 375 linear yards and a 15" diameter about 1150 linear yards.

SEND FOR SAMPLES—simply specify width desired.

THE CLEVELAND LINER & MFG. CO.
5508 Maurice Ave. • Cleveland 27, Ohio, U.S.A.
Cable Address: "BLUELINER"



ILLUSTRATED LINER BOOKLET

Tells all about Climco Liners and Linerette and how to get better service from liners. Write for your copy now.

LINERETTE INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

CLIMCO
PROCESSED LINERS
Serving the Industry Since 1921

How ounces of rubber can harness herds of horses

Keeping the herds of horses harnessed in today's aircraft engines "on the go" often depends upon a few ounces of rubber. In the form of "O"-rings, frequently no bigger than a pencil eraser, this rubber serves as a packing on actuating cylinders, selector valves and other vital parts where positive sealing is essential.

It used to be that "O"-ring failures were all too frequent. Ordinary rubber could not withstand the various hydraulic fluids, the –40°F. to 160°F. temperatures, the flexing, the stretching, the elongation. But the picture changed when Goodyear introduced CHEMIGUM—first of the truly oil-resistant rubbers.

The unique composition of CHEMIGUM soon made possible "O"-rings with an absolute minimum of swell or shrinkage, excellent resistance to heat and cold, very low compression set and maximum squeeze combined with minimum friction. And its easy processing permitted meeting tolerances in the very low thousandths of an inch.

Perhaps the fate of your product also can be assured a success by CHEMIGUM. For full details plus the finest in technical service, just write to

Goodyear, Chemical Division
Dept. X-9419, Akron 16, Ohio

GOODYEAR

CHEMICAL DIVISION

CHEMIGUM • PLIOFLEX • PLIOLITE • PLIOVIC • WING-CHEMICALS

Chemigum, Pliofiex, Pliolite, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Photo courtesy Exide Industrial Division, Electric Storage Battery Co., Philadelphia, Pa.

Want a battery of compliments?

If you're looking for a product that will win compliments everywhere, why not take a lesson from the manufacturer of the big batteries shown above. For he has learned through experience, that some jobs are just made to order for PLIOFLEX rubber.

His particular problem lay in finding the right material for the battery cases. Conventional container materials just didn't have the strength or resilience to withstand the shock, pressure and abuse of rugged Diesel locomotive service. His answer was to pioneer the use of fully molded, hard rubber cases and covers.

At first, natural rubber was used. But then his case supplier suggested changing to PLIOFLEX. The reasons? PLIOFLEX is considerably more uniform, accepts a wider variety of fillers for easier compounding, processes more readily and cures faster. The end result: A better battery case at lower cost.

How can PLIOFLEX improve your product? Why not find out by writing, today, for full details and the finest in technical assistance. Address:

Goodyear, Chemical Division
Dept. X-9419, Akron 16, Ohio

GOODYEAR

CHEMICAL DIVISION

CHEMIGUM · PLIOFLEX · PLIOLITE · PLIOVIC · WING-CHEMICALS

Chemigum, Plioflex, Pliolite, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

What's first and foremost for foam?

First and foremost choice of a number of manufacturers of foamed rubber products is one of two Goodyear latices—PLIOLITE LATEX 2104 or PLIOLITE LATEX 2105.

PLIOLITE LATEX 2104 is a "cold" polybutadiene latex which exhibits virtually no odor. This feature plus its high solids content and excellent mechanical stability make PLIOLITE LATEX 2104 extremely well-suited to the production of pillows, mattresses and other types of cushioning.

PLIOLITE LATEX 2105 is a "cold," high solids, butadiene/styrene latex. It, too, exhibits excellent mechanical stability with light color, high physical properties and low temperature flexibility—for advantageous use in foamed goods where very slight odor is permissible.

In addition to these latices, there are a number of other rubber and resin latices in the PLIOLITE family. Each can be used alone or in combination with the others to obtain specific properties in foam or any of the many applications for latex.

Details plus the latest *Tech Book Bulletins* on PLIOLITE LATEX are yours by writing to:

Goodyear, Chemical Division, Akron 16, Ohio

CHEMICAL
GOODYEAR
DIVISION

Chemigum, Plioflex, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

COATINGS DEPARTMENT

CHEMIGUM • PLIOFLEX • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS

High Polymer Resins, Rubbers, Latices and Related Chemicals for the Process Industries

MODERN FOR YEARS TO COME

DRYERS

COOLERS • EXTRUDERS • FEEDS

by

SARGENT

guarantee you . . .

More pounds per hour

Least cost per pound

Here's what a Sargent gives you:

Completely automatic, trouble-free performance. Dependable, quality production. Speediest installation. Least downtime (Sargent's exclusive design means easiest, quickest cleanout). Rugged construction. Incorporates every modern safety device. Designed for steam, extended surface heating elements, electric strip heating, or for added economy in natural gas areas, gas fired, direct or indirect. (Sargent pioneered the first successful gas-fired synthetic rubber dryer.) Advanced engineering by men who respect your requirements — A Sargent is Modern for Years to Come.

C. G. SARGENT'S SONS CORPORATION

Graniteville, SINCE 1852 Massachusetts

PHILADELPHIA 19 — F. E. Wasson, 519 Murdock Road
CINCINNATI 15 — A. L. Merrifield, 730 Brooks Avenue
CHICAGO 44 — John Law & Co., 5850 West Lake St.
DETROIT 27 — Clifford Armstrong Co., 16187 Grand River Ave.
HOUSTON 17, TEX. — The Alpha Engineering Co., Box 12371
CHARLOTTE, N.C. — W. S. Anderson, Carolina Specialty Co.
ATLANTA, GA. — J. R. Angel, Mortgage Guarantee Building
TORONTO 1, CAN. — Hugh Williams & Co., 27 Wellington St. East

News in Brief

► Rubber Laboratory Release No. 20, published by the Barrett Division, Allied Chemical & Dye Corp., New York, N. Y., covers "A-C Polyethylene Lubricant 8407 in a Mineral-Filled Butyl Rubber Compound."

► "Compounding Research Report No. 40," published by the Naugatuck Chemical Division of the U. S. Rubber Co., deals with Ethazate 50-D, a 50 per cent Ethazate slurry for use in latex.

► Elastomer Chemicals Department of the E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has issued "Report BL-337" which deals with low moisture absorbing neoprene cable jackets for 75°C. service.

► Chemical Division of the Goodyear Tire & Rubber Co. has issued a bulletin which summarizes the effect of "Pliolite S-6B" in hot, cold and oil-extended styrene rubbers, entitled "Tech Book Fact 57-47."

► New silica gels, hydro gels and other synthetic silicas are introduced in a four page bulletin "No. MAC," issued by the American Industrial Chemical Co., Cooper Park, Butler, N. J.

► A technical bulletin covering the uses and properties of "SRS-55," an anionic stabilizer for natural and synthetic latices, has been released by Seaboard Chemicals, Inc., 30 Foster St., Salem, Mass.

► M. Michel and Co., Inc., 90 Broad St., New York 4, N. Y., has made available a new fact sheet on Cachalot fatty alcohol, which shows typical uses for lauryl, cetyl, stearyl and oleyl alcohols.

► What to do and what not to do in installing and caring for unit heating equipment is treated in a new illustrated bulletin (No. 12) entitled "Care and Maintenance of Steam and Hot Water Unit Heater," published by the Air Moving and Conditioning Association and available through Denham & Co., 925 Brook Bldg., Detroit 26, Mich.

► J. H. Day Co., Division of the Cleveland Automatic Machine Co., Cincinnati 12, Ohio, has announced the successful application of the company's new heavy duty Day Dispersion Mixer for the processing of solid propellant fuels. Further details are available through the company.

► Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton, N. J., has released Bulletin 104-2, "An Evaluation of Non-Black Fillers For Colored Butyl Compounding."

Your BEST BET...

for better floor tile production!

Marbon "8000-A"®

REINFORCING HIGH STYRENE RESIN

ON THE FLOOR OR THE KITCHEN DOOR—SCORES OF HOUSEHOLD USES

- Floor Tile
- Sink Mats
- Strainers
- Soap Dishes
- Door Stops
- Caster Cups
- Basin Stoppers
- Force Cups
- Door Bumpers

And those hundreds of "Every day in use" rubber household items every homemaker wants.

Marbon "8000-A" is the superior-processing resin which fluxes rapidly at lower temperatures (165-175 degrees F.). For improved dispersion, shorter mixing cycles, cleaner brighter colors and faster heat-plasticizing action with lowered power demand, you can't beat this outstanding high styrene resin. Contains all of the reinforcing properties of Marbon 8000 — Gloss — Durability — Dimensional Stability.

PACESETTER IN

Marbon CHEMICAL

SYNTHETIC RESINS

DIVISION of BORG-WARNER

WASHINGTON, W. VA. • GARY, INDIANA

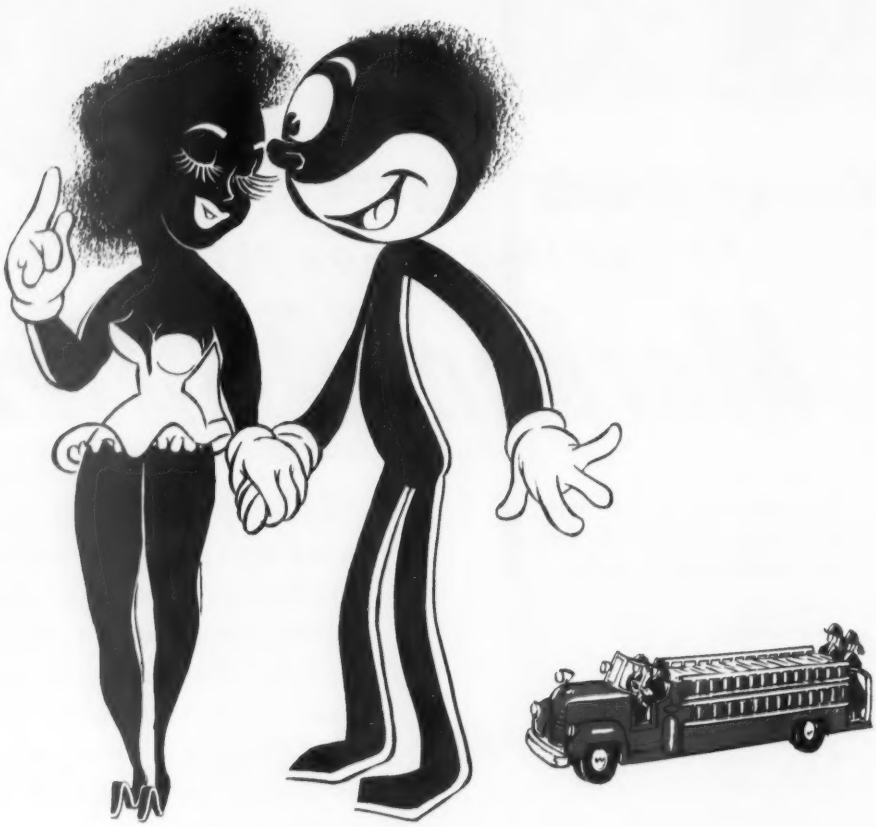
also represented by:

WEST COAST: Harwick Standard Chemical Co., Los Angeles, Cal.
CANADA: Dillons Chemical Co. Ltd., Montreal & Toronto
EXPORT: British Anchor Chemical Corp., New York

BW® Marbon

MARBON . . . *It BLENDS as it STRENGTHENS as it IMPROVES*

Merry Christmas and Happy New Year



from the Philblacks* and the Philprenes*

*A trademark

PHILLIPS CHEMICAL COMPANY

Rubber Chemicals Division, 318 Water St., Akron 8, Ohio

District Offices: Chicago, Dallas, Providence and Trenton • **West Coast:** Harwick Standard Chemical Company, Los Angeles, Calif.
Export Sales: 80 Broadway, New York 5, N.Y. • **European Office:** Phillips Chemical Company, Limmatquai 70, Zurich 1, Switzerland

Cooking up a better rubber recipe?

Add a pinch of permanence

Will the properties you put into a rubber compound today still be there later, when you need them?

Many firms *make sure* they will be—by compounding with Durez phenolic resins.

Mix one of these versatile resins with synthetic rubber, and it melts under heat to plasticize the stock for easy working and accurate molding. Then the resin cures rapidly, toughening the stock; making it hard, stiff, abrasion resistant. With some types of rubber, fast cure is accomplished without using sulfur or accelerators; high tensiles are achieved without fillers.

Because these resins are heat-setting, the hardness and stiffness they bring to a stock are retained at temperatures as high as 250° F. You get *more permanence* than with other types of resins—and you pay less for it.

Durez resins are completely compatible with nitrile rubbers. Their compatibility with SBR is less, but can be increased greatly by using some nitrile rubber as a common solvent or flux. The resins are proving effective also for hardening and reinforcing nitrile rubber, natural rubber, and neoprene.

You can get these versatile resins in powder, lump, liquid, and emulsion forms—to meet widely varying process requirements. For more complete information on how they are used, write for illustrated bulletin, "Durez Resins in the Rubber Industry."

DUREZ® HOOKER THERMOSET PLASTICS

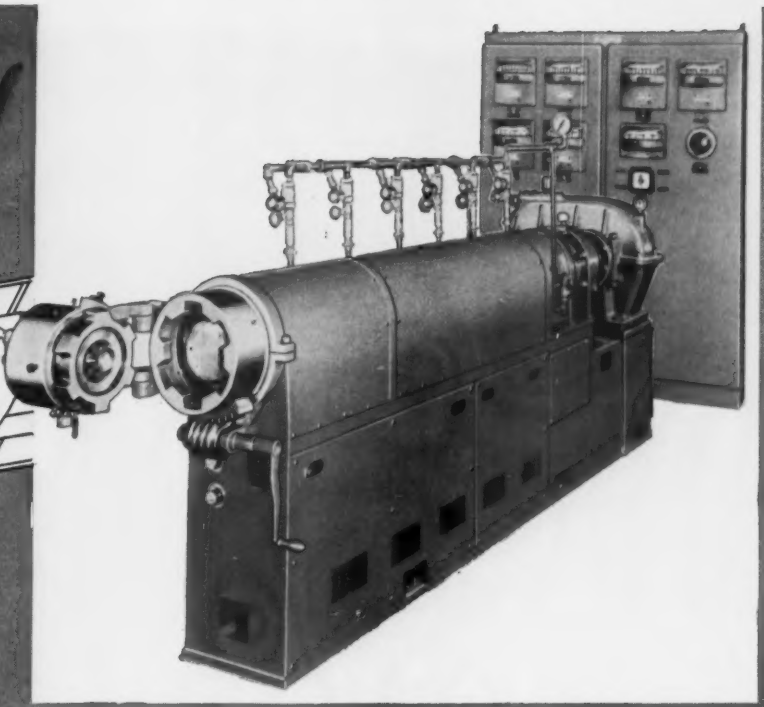
PLASTICS DIVISION

HOOKER CHEMICAL CORPORATION

112 Walck Road, North Tonawanda, N. Y.

NEW!

HIGH PRESSURE EXTRUDER



INDUCTION HEAT, with the Kullgren temperature control system, has these advantages: fast heat-up (to 400° in 20 minutes), low-cost operation at high temperatures, quick cooling, and "on-the-button" control.

HIGH PRESSURE screw and cylinder with all parts designed for long life at operating pressures up to 10,000 psi.

QUICK OPENING HEAD maintains a tight seal at the maximum pressures of 10,000 psi.

HIGH SPEED for increased production (150 rpm on a 3½-inch screw). All gearing and bearings designed for high-horsepower drives.

PRESSURE CONTROL by means of screw orifice can be adjusted continuously, manually or automatically, while running.

QUALITY ... better quality and increased production result from the use of CONTROLLED HIGH PRESSURE dies and extruders. New plastics coming on stream will emphasize the advantage of HIGH PRESSURE EXTRUSION.

Aetna-Standard is currently delivering high pressure induction-heated extruders and dies. These machines are available in all standard sizes in addition to the well-known line of standard extruders.

Sales and Engineering

HALE AND KULLGREN, INC. • AKRON, OHIO

AETNA ENGINEERING COMPANY
STANDARD
PITTSBURGH, PENNSYLVANIA

A NEW DIAMOND DEVELOPMENT...

ANNOUNCING CARBIUM

a new precipitated calcium carbonate for faster, easier, low-cost processing

CARBIUM is a new dense precipitated calcium carbonate developed by Diamond for use in highly loaded compounds where low modulus is desired. It can speed up processing and cut your costs.

CARBIUM can be employed in very high loadings (as high as 300 parts to 100 parts of rubber), while maintaining a fast mixing cycle with low heat build-up. Gives good dispersion and good color stability in light-colored items.

Physical Properties of Carbium

Linseed Oil Absorption, cc/100 grams	30-35
Packed Density, lbs./cu. ft.	66-73
Specific Gravity	2.65
Color	White
Particle Size, microns	1-10

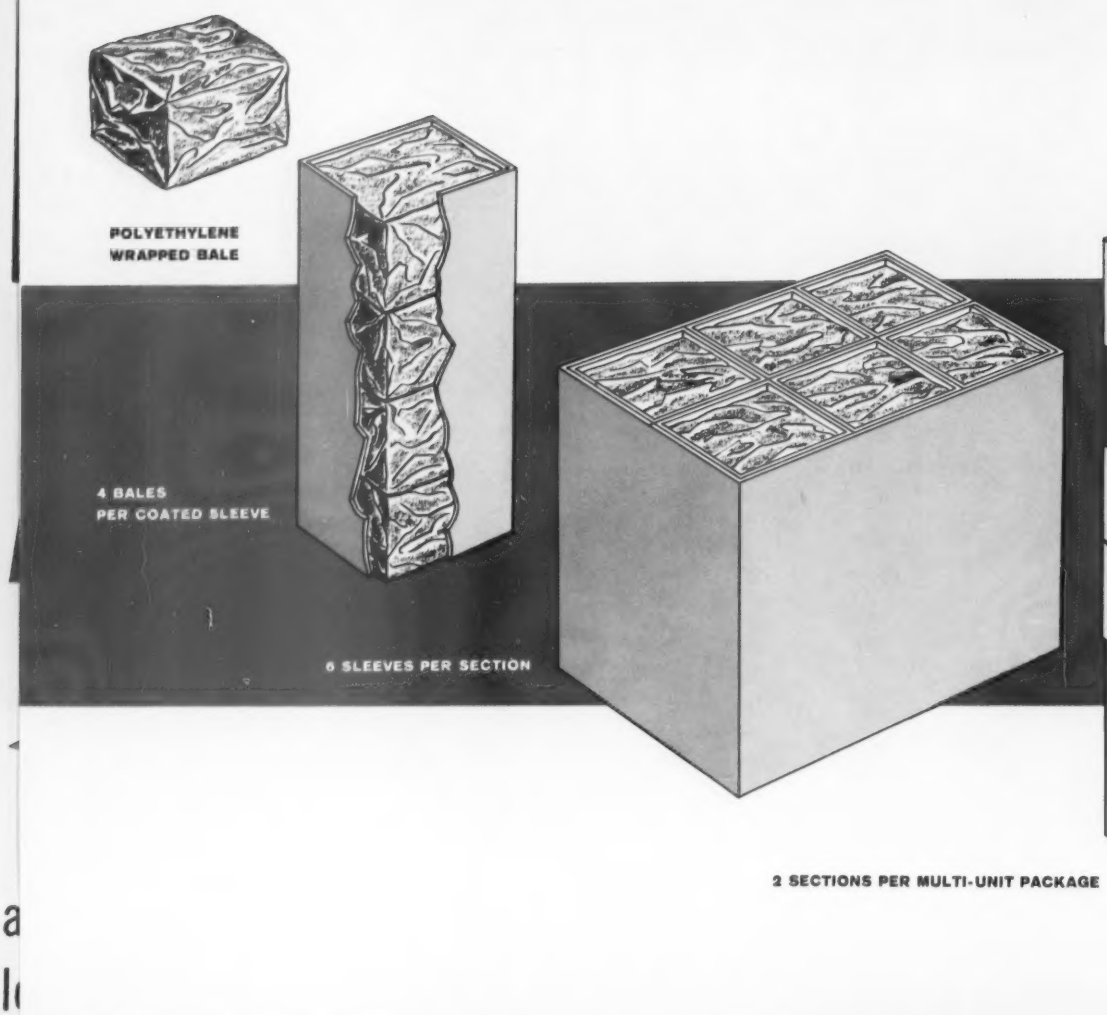
Write today for full information. Ask Diamond's technical service group for any assistance you need in the application of Diamond Chemicals. Diamond Alkali Company, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals®

NOW ENJAY BUTYL IN THE NEW MULTI-UNIT PACKAGE

ENJAY® BUTYL

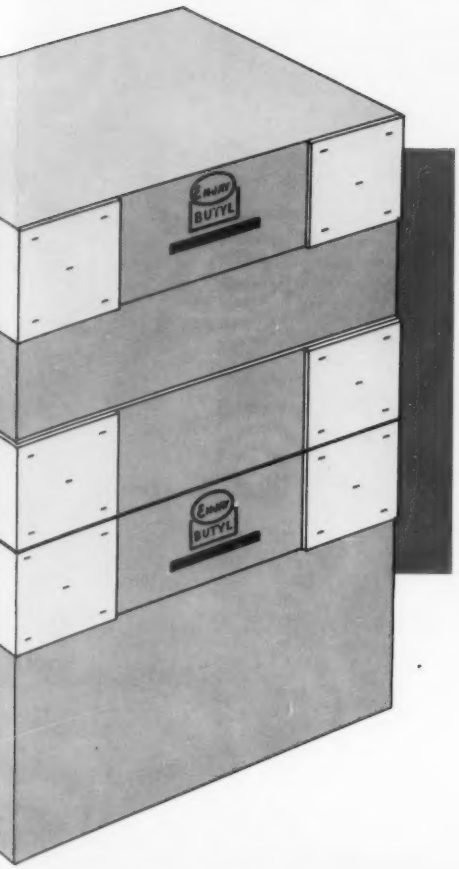
Here's what it means to you...



EACH SECTION CONTAINS SIX CORRUGATED SLEEVES each holding four bales of polyethylene-wrapped Butyl. Thus, you get a total of 48 bales of Butyl in a complete Multi-Unit Package.

YOU NOW CAN UNLOAD FASTER in the close quarters of trucks or freight cars due to package size, shape and construction. New Multi-Unit Packages can be conveniently handled by low-cost palletless methods.

BECAUSE OF THE MULTI- your storage and shipping spac lized. The two separate 36" sec practically any available storag



THE NEW MULTI-UNIT PACKAGE

- Reduces unloading costs
- Allows efficient use of storage space
- Affords handling economies
- Protects product until used.

THE NEW MULTI-UNIT BUTYL PACKAGE weighs approximately 2,800 pounds and may be conveniently divided into two separate sections, each weighing about 1,400 pounds. The over-all package measures 32″ x 48″ x 72″. Each of the two separate sections is 36″ high.

ULTI-UNIT PACKAGE, space can be fully uti- sections permit use of storage space.

MOVEMENT WITHIN YOUR WAREHOUSE IS EASIER. The extra-strong, extra-light reinforced package supplies protection against knocks, bumps and in-transit sliding.

THE UPPER AND LOWER SECTIONS CAN BE SEPARATED by inserting the fork of the fork lift truck between the two sections. This versatility of the package permits the storing or handling of Butyl in either 2,800 or 1,400 pound units without removing it from a closed and sealed package.

THE NEW MULTI-UNIT PACKAGE FOR ENJAY BUTYL PROVIDES...

- Fast Unloading...
- Fast Convenient Handling...
- Ease of Storage...
- 48 Individual Bales (Polyethylene wrapped)
- Protection of Product during storage and shipping.

THE NEW MULTI-UNIT PACKAGE IS ANOTHER EXAMPLE OF HOW ENJAY IS HELPING YOU TO REDUCE COSTS

ENJAY COMPANY, INC.
15 West 51st Street • New York 19, New York

AKRON • BOSTON • CHARLOTTE • CHICAGO • DETROIT
LOS ANGELES • NEW ORLEANS • TULSA

ENJAY

CHRISTMAS SEALS AT WORK!

A most important medical discovery during the past year was a blood test for the detection of tuberculosis.

Developed at Northwestern University under a research grant from the National Tuberculosis Association, it is now undergoing widespread trials. This was made possible by your purchase of Christmas Seals.

Since 1907, the work financed by Christmas Seals has helped cut the TB death rate 95% – but within the next 20 years almost 2,000,000 Americans will be afflicted with tuberculosis. So, send in your contribution today, please.

Buy and use Christmas Seals

This space contributed to the National Tuberculosis Association and its affiliates by

RUBBER AGE

For adipate polyesters and monomeric and polymeric plasticizers
Evaluate all the advantages of
NATIONAL® ADIPIC ACID

If you use or contemplate using Adipic Acid in elastomers, plastics, plasticizers, synthetic lubricants or as a chemical intermediate, we urge you to get a working sample and quotation from National Aniline.

Our product quality has been found outstanding by many substantial users. Strength is 99.8% minimum with low moisture, iron and volatile acids.

Our new non-captive production by a direct, continuous process is completely integrated back to basic materials within the Allied Chemical group.

We can supply the quality and the quantity you need – promptly and dependably – by truck or rail from Hopewell, Virginia with fill-in stocks readily available at many branch office warehouses.

NATIONAL ANILINE DIVISION

40 RECTOR STREET, NEW YORK 6, N. Y.

Akron Atlanta Boston Charlotte Chattanooga Chicago Greensboro Los Angeles
New Orleans Philadelphia Portland, Ore. Providence San Francisco Toronto

Allied Chemical

on the continent

by FELIX F. FLUSS

• A new factory, Bunawerk Huels GmbH, in Marl, West Germany, officially went on stream on September 15. The plant was to have had a 45,000 ton capacity annually. However, production has already reached 70,000 tons and is expected to be increased later to 180,000 tons. At the present expansion rate, it is believed that synthetic rubber capacity in West Germany will reach 3.1 million tons by 1960.

Other European developments include the construction of a butyl rubber plant in France, the first in Europe, having a rated capacity of 20,000 tons. Italy plans to utilize her natural gas to produce 65,000 tons of synthetic rubber. In England, factories rated at 50,000 tons are now under construction, while plants capable of producing an additional 60,000 tons are in the planning stage.

Taking into consideration two additional French projects, with a production of 40,000 tons, and Dutch plants having a capacity of 50,000 tons, Western European production of synthetic rubber is expected to amount to about 330,000 tons by 1960. It is estimated that in two years, the free world will have a capacity of 2.13 million tons if prospective production figures for the United States are included. World output will be about 3.1 million tons annually if the iron curtain countries succeed in their plan to double production by 1960.

• The International Plastics Fair will be held in Duesseldorf, West Germany, from October 17 to October 25, 1959. More than 541 manufacturers from eleven different countries have applied for space and to date, it is indicated that 110 machinery factories, 56 raw materials manufacturers and 298 plastics processors will be represented. This is the first time that the exhibit will be open to foreign manufacturers.

World production of plastics has increased from about 1.5 million tons in 1950 to more than 3 million tons in 1957, current reports state. The United States produced 1.67 million tons; Western Germany, 589,000 tons; East Germany, 12,000 tons; Great Britain 355,000 tons; France, 163,000 tons; Italy 134,000 tons; Japan, 3000 tons; and all other countries 266,000 tons.

• Pirelli states in its annual report to stockholders that 1957 was a good year although sales decreased from 90 to 88 billion Lire (about $145 million). The volume of domestic operations was slightly off, but foreign subsidiaries did well. The company obtained an order amounting to $1.6 million from Western Electric for electric cables, and sales of deep sea cables, which began to increase during 1957, have continued to rise.

The Spanish Pirelli S. A. contemplates building a new factory for the production of foam rubber and various rubber articles. To be completed in 1960, the new facility will be located in Tarragona.

• Messrs. H. G. Elias and T. Ritscher, of the Institut fuer Chemische Technologie der Technischen Hochschule, in Munich, have reported the development of an instrument for molecular mass determination. This is a double chamber osmometer with a diaphragm containing 95 per cent SiO_2. With this unit, it is said to be possible to make measurements in concentrated acids with over-pressure at temperatures up to 300°C. It is reported that the osmometer gives satisfactory results with moelcular weights over 3000.

• Shell-Saint-Gobain, Michelin and Texas-Butadiene-Cabot have established a syndicate, which will later include additional participants, in order to build a butadiene-styrene factory having a 50,000 ton capacity. The facility is scheduled to start operating during 1961. To be located at Berre, France near the Shell refinery and in the vicinity of the chemical and carbon black works of Shell-Saint-Gobain and Cabot, the new factory will be close to manufacturers of important raw materials.

About The Author . . .

Felix F. Fluss

► Felix F. Fluss studied mechanical engineering and chemistry at the "Technische Hochschule" and also graduated from the "World Trade Academy" in Vienna, Austria. He worked for several Austrian dailies and periodicals in an editorial capacity and afterwards organized his own business, publishing and editing a trade paper dealing with the gramaphone, amplifier and radio field. Other trade organs published by Mr. Fluss, covered the photographic, optical, chemical and shoe industries.

Mr. Fluss has traveled throughout Europe, visiting important industrial centers, calling on manufacturers and wholesalers, and attending conventions and trade fairs. He has taken annual trips to Germany, France, England, Switzerland, and other countries, in order to maintain contact with various industries covered by his business papers.

A United States citizen since 1944, Mr. Fluss was associated for a number of years with the mill supply and hardware field. About two years ago, he returned to his former activities and has been appointed American correspondent for 28 European trade papers. He has written several books, one of them "Technology and Chemistry of Modern Shoe Repairing" is in the Library of Congress and the New York Library.

On the Continent

The enterprise will utilize the technical and industrial experience of its neighbors and founders and will have the cooperation of their research departments. These departments are currently engaged in the development of improved production techniques for synthetic rubber and also in the development of new processes for raw materials, and new grades of synthetic elastomers. It is believed that the new facility will enable the French rubber and tire industries to compete successfully on the world market. At the same time, export shipments are expected to earn a considerable amount of much needed foreign currency.

• European trade journals report that United States synthetic rubber production amounted to almost 90 per cent of the total synthetic rubber output of the western world in 1957. If production figures in the iron curtain countries are included, the United States manufactured approximately ⅔ of the synthetic rubber produced in the world. This is considered to be a real accomplishment as the United States has been manufacturing synthetic rubber only since World War II.

• Chemolimpex, the export organization of chemical products located in Budapest, Hungary, is soliciting Western European business. The firm has placed advertisements in German trade papers which state that the Hungarian rubber industry has more than 75 years of experience, and that at present, all rubber products exported are of excellent quality.

• The Austrian Semperit factory has reported increased sales in 1957. The labor force has been increased to 7600 men, and production amounted to about 30,000 tons, exceeding, for the first time, one billion Austrian schillings ($40 million). Export sales increased by 50 per cent and the net profit amounted to 14.8 million schillings ($592,000), enabling the company to pay a dividend of eight per cent.

• A new method for the reduction of costs of latex foams has been reported. Because latex represents up to 70 per cent of the cost of foam rubber, considerable savings are necessary in order to produce this material economically. G. M. Kraay of Delft, Holland, reports that the conventional method of cutting down costs consists of hollowing the foam sheets in order to obtain the required stiffness while using a minimum quantity of material. Of course, the volume of hollows is limited. The utilization of organic or mineral filler can improve the process. The fillers must combine maximum stiffening action with minimum stiffness loss after processing. It is also possible to stiffen the finished product with a solution of certain chemicals. However, a considerable loss after processing will be off-set by the much improved quality of the finished article.

• A synthetic rubber factory will be constructed in Czechoslovakia with the technical assistance of Moscow. The factory will be built in Kralupy, near Prague, and is expected to be completed in 1964. The cost of the building and machinery will amount to approximately one billion Czechoslovakian kronen (about $20,000,000), it has been reported.

• Dunlop England has arranged with the Turkish Federal Turk Kamyonlari A. S. in Ankara, to build a tire factory. The Turkish government has already approved the application and has granted financial assistance. Dunlop, which will provide technical experience and cooperation in the planning and construction of the new factory, will acquire a financial interest. The new factory is supposed to cover the major part of Turkish tire requirements.

• Based on information released by the Ministry for Chemistry of the USSR, production of plastics materials in the Soviet Union during 1957 amounted to: phenolic resins, 64,800 tons; melamine and urea resins, 53,800 tons; epoxy and alcyde resins, 28,200; fluorides and similar compounds, 20,000; caprolactam-nylon, 12,800; silicones, 2200; and other thermoplastics, 60,500 tons. Total production of plastics materials amounted to 242,300 tons.

• Red China has expanded her rubber and plastics production. The second five year plan, which will end in 1962, includes the increase of plastics production to about 58,000 tons. The new chemical center, located in Kirin (Manchuria) will consist of factories for the production of synthetic rubber, plastics and synthetic fibers.

• Royal Sulphuric Acid Works Ketjen, Ltd., plans to build an oil furnace carbon black plant in the Netherlands. The Dutch firm will manage and will also be majority stockholder in the new carbon company. To be known as Ketjen Carbon, N. V., the company will sign a license agreement with Godfrey L. Cabot, Inc., under the terms of which it will acquire patent rights and technical know-how.

The plant will be built in the Botlek area near Rotterdam and will supply Belgium, Luxembourg and The Netherlands with 30,000,000 pounds of oil furnace blacks annually.

The Dutch firm will take advantage of the new Common Market among the countries of France, Italy, Western Germany, Belgium, Luxembourg and The Netherlands. Through the establishment of the Common Market, tariffs among the six countries will gradually be abolished.

• Dunlop Rubber Co., Ltd., Manchester, England, has developed a new urethane which is said to be particularly suitable as a replacement for cast iron in gears and pulleys, for metal components requiring fatigue resistance and for hard-to-lubricate metal bushings. Called "Duthane," the product has a tensile strength of 6000 psi; an abrasion resistance five times that of rubber-tread stock; and elongation at break of 750 per cent, it is claimed.

• From January to July 1958, Germany produced 4,778,000 automobile tires; 614,000 truck tires; 7,146,000 bicycle tires; and 552,000 motorcycle tires. Germany imported 64,299 tons of natural rubber and used 27,934 tons of synthetic rubber in order to manufacture 92,233 tons of new rubber.

Season's Greetings

From Witco and its Divisions...

WITCO CHEMICAL COMPANY
Chemicals for Rubber, Paints and Plastics

CONTINENTAL CARBON COMPANY
Furnace Blacks and Channel Blacks

ULTRA CHEMICAL WORKS
Synthetic Detergents and spray-dried Chemicals

EMULSOL CHEMICAL CORPORATION
Emulsifiers and Surface-Active Agents

PIONEER PRODUCTS DIVISION
Asphalts and Asphaltic Compounds

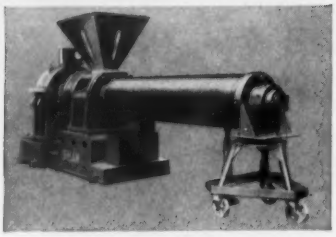
WITCO CHEMICAL COMPANY 122 East 42nd Street, New York 17, N.Y.

FRANCIS SHAW

quality engineering puts efficiency into Shaw machines

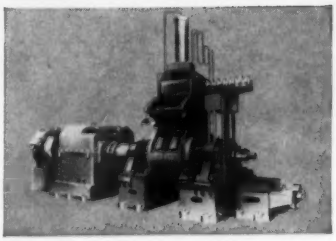
The cost-cutting performance of every Francis Shaw machine and its thorough dependability are the result of long experience and unvarying high standards of engineering in every detail of manufacture.

Close-limit accuracy and rigorous inspection during manufacture guarantee to the user a consistently high quality output from Francis Shaw equipment.



PLASTIC EXTRUDER. Fine temperature control is a vital feature of Francis Shaw extruders. All electric heating in separate zones is provided, each zone being separately controlled by proportioning instruments. A wide range of screw and die designs is available for the production of piping, sheeting, sections and the sheathing and insulation of cables. Extruder sizes from 1" to 12".

CALENDER. A comprehensive range of Francis Shaw Calenders is available for the processing of all rubber and plastic materials. Flood Lubrication and hydraulic roll balancing available on all production sizes. Roll Bending can be fitted as an additional refinement. All sizes available from 13" x 6" to 92" x 32". Two-, Three- and Four-Bowl Designs.



INTERMIX. A robust, high efficiency Heavy Duty Internal Mixer for mixing plastic compounds at lower-than-normal temperatures. It is supplied with steam heating for plastics and other materials, and the exclusive rotor design ensures consistent high quality mixing.

FRANCIS SHAW

QUALITY ENGINEERING FOR QUANTITY PRODUCTION

Francis Shaw are available for the design, manufacture, and installation of a wide range of processing equipment

FRANCIS SHAW & COMPANY LIMITED MANCHESTER 11 ENGLAND

TELEPHONE EAST 1415-8 TELEGRAMS CALENDER MANCHESTER TELEX 66-357

LONDON OFFICE 22 GREAT SMITH STREET SW1 *PHONE ABBEY 3245* *GRAMS VIBRATE LONDON TELEX 2-2250*

FRANCIS SHAW (CANADA) LTD GRAHAMS LANE BURLINGTON ONTARIO CANADA

TELEPHONE NELSON 4-2350 *TELEGRAMS CALENDER BURLINGTON ONTARIO*

P.1160

AMOCO CHEMICALS—A NEW RESOURCE

How to reduce cost, improve storage stability of vinyl plastisols

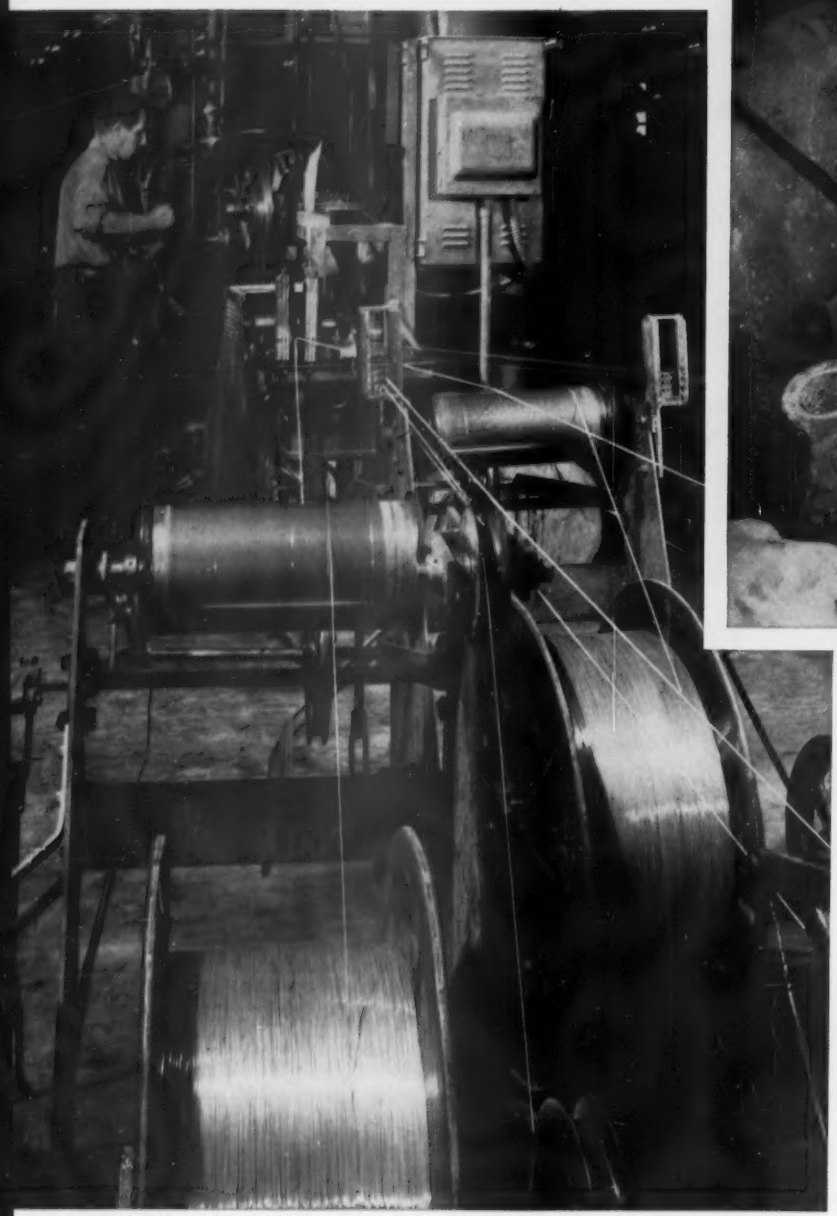
Manufacturers of plastisols for expendable uses—sealants, dip-coated parts, foam, sponge, etc.—and other large-volume, low-cost applications can reduce costs by using PANAFLEX BN-1 as a secondary plasticizer. And PANAFLEX BN-1 can help improve storage stability of plastisols. In a test of storage stability over a 50-day period at a temperature of 115° F., PANAFLEX BN-1 demonstrated superior ability to reduce plastisol viscosity build-up.

PANAFLEX BN-1 is a hydrocarbon plasticizer. It is compatible with vinyl chloride polymers and copolymers. Electrical properties are excellent. Volatility and color stability are comparable to the best hydrocarbon plasticizers.

More facts about PANAFLEX BN-1 as a secondary plasticizer in plastisols are ready for you. Send for them. Your request will receive an immediate reply.

AMOCO CHEMICALS

AMOCO CHEMICALS CORPORATION
910 South Michigan Ave., Chicago 80, Illinois



Strength is built into tires here where tire beads are built on special machines. From these pay-off reels, tire bead wire is gathered in the specified number of strands and insulated and coated with rubber to form a flat, tape-like band. The finished bead has the job of holding the tire firmly to the wheel. That's why . . .

Close-up shows how strands of bronze-plated steel bead wire get a coating of rubber which provides insulation and prevents flexing of wire in use. The bronze coating on the wire provides good adhesion between steel and rubber. The number of strands used to make one wrap varies according to the type of tire being made.

General's Beads Keep Tires Safe

Johnson Steel Co.'s Tire Bead Wire Builds Strength, Long Life Into LCM Giant Tires

While keeping ahead of automakers' demands for better tires on heavier, more powerful new cars, The General Tire & Rubber Co. also built added strength and safety into the big tires used in off-the-road equipment.

As off-the-road rigs grew in size and capacity, the giant tires made for the logging, construction and mining industries became larger, more durable and stronger.

General's LCM Giant Tires measure up to eight feet in diameter, weigh up to 1,900 pounds and contain as many as 30 plies. Each of the eight beads in a giant may have as many as 17 wraps of bead wire, like that supplied by Johnson Steel & Wire Co., Inc. And each wrap, or layer, may contain as many as 12 strands of rubber-coated bead wire.

Giants equipped with beads made of Johnson Wire can take recap after recap. All through the rugged service which tears off treads, the steel beads buried out of sight near the tire's edges continue to do their primary job of holding the tire to the rim.

Beads are so reliable that tire failure due to bead trouble is virtually unknown.

In this accomplishment, Johnson Steel's wire mills and General Tire technicians form a combination that pays off in exactly the right kind of wire from the mills and more effective and efficient tire engineering.

Johnson Steel provides bead wire —bronze-plated for good adhesion between steel and rubber—of high, uniform quality. Because the wire meets General Tire's specs consistently, tire engineers can blueprint bead designs for different types of tires with confidence that the wire will perform as expected.

Here the bead gets a wrapping of cover stock. This rubberized fabric holds the wraps of bead firmly in place in the finished tire.

Tire bead is placed on a giant tire after addition of filler material and a flipper of fabric. Filler and flipper help the tire maker firmly attach the bead to the plies seen on the drum. A giant tire like this requires four beads on each side, and is rated at 36 plies.

• **12 Strands Of Bead Wire**—Engineers may vary the number of wire strands used—four in a typical passenger tire. The number of times a rubber coated tape of the strands is overlaid in a circular pattern helps determine the size of the final bead.

By specifying the number of strands, the number of wraps and the quantity of beads used in a tire, engineers match tire performance with the demands to be made upon it.

That explains why General Tire is particular about the bead wire it buys and why Johnson Steel draws bead wire from tested heats of steel with exacting care.

At General Tire, every shipment of incoming wire is subjected to tests for tensile strength, elongation, adhesion qualities, uniformity of bronze coating, breaking strength and torsion strength.

• **Ability Pays Off**—Johnson Steel's ability to meet these requirements gives assurance to users of all kinds of specialty wires that Johnson can and will meet their demands for uniform high quality.

This ability pays off for General Tire in helping the tire manufacturer maintain its fine reputation for safety and long service.

Passenger car owners get exactly the same wire as contractors who buy LCM Giant Tires. It's .037 gage tire bead wire, plated with bronze in the ratio of one gram of bronze for every kilogram of wire.

Johnson Steel & Wire Co.'s success in finishing bead wire for all types of General Tires is typical of Johnson's achievements in the whole range of fine wire specialties, everything from music spring wire to aircraft cord wire and including:

Armature binding wire, belt hook wire, bobby pin wire, gutter broom wire, card wire, shade roller wire, flexible shaft wire, textile industry wires, hose reinforcement wire, rope wire, safety pin wire, shaped wire, staple wire, metal stitching wire, Signal Corps wire and MB spring wire.

If you use any of these wires it will pay you to ask a Johnson representative to explain what benefits you can expect from the uniformity and dependability of any Johnson steel product. You'll find him at the nearest district office listed below. He's as near as your telephone.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

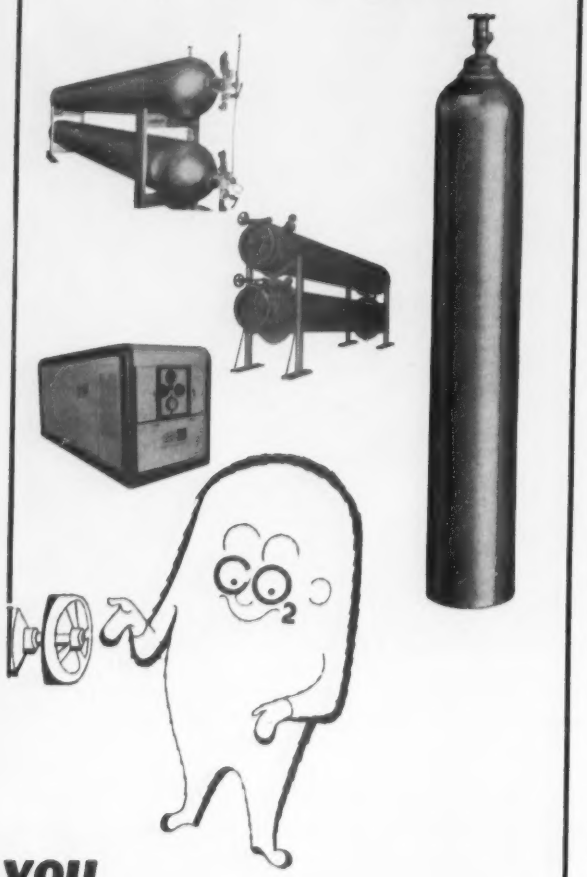
a subsidiary of **Pittsburgh Steel Company**

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

PURECO CO Supply Systems



you
TURN A VALVE
—PURECO
does the rest!

Pureco offers a variety of both high and low pressure CO_2 supply systems—*cylinders, cylinder banks, converters, receivers*—as modern as today—each "tailored" to fit your particular requirements. Pureco will supervise the installation, maintain and insure the function of the equipment—also assure a dependable supply of CO_2 from over 100 conveniently located distribution points. Call your Pureco representative today!

PURECO CO

Pure Carbonic Company

A Division of Air Reduction Company, Incorporated
150 EAST 42nd STREET, NEW YORK 17, N. Y.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT

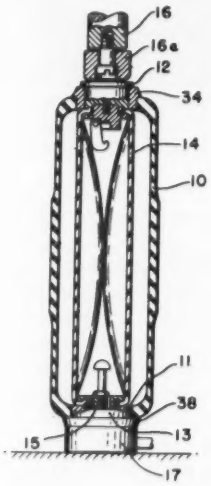
PATENT REVIEW

by Melvin Nord

Apparatus for Shaping Tires

U.S. Patent 2,824,336, issued February 25, 1958 to Harold Weigold, Robert A. Merrill, and Joseph C. Andreini, assigned to United States Rubber Co., describes a device for shaping tires from flat band form to a doughnut-shaped or toroidal form. The apparatus is especially useful for tires of large cross-section through the tire carcass and of small inside or rim diameters, such as the tires used on aircraft tail wheels.

In shaping of such tires it has been the custom to insert a conventional semi-rigid curing bag and then by a process of gradual inflation of the curing bag, alternated with setting periods for the



carcass to retain its new shape, to give the carcass the necessary doughnut shape for loading in the vulcanizing mold. The process is time consuming. Moreover, after curing of the carcass, it is difficult to remove the curing bag without damage to it because the required curing bag of large cross-section has to be pulled through the narrow opening determined by the rim diameter of the finished tire casing. These deficiencies are overcome by the present invention which provides means for inserting a thin flexible curing bag within the tire carcass, shaping the carcass to toroidal form and then holding the carcass in such form for any period of time prior to or during vulcanization.

The schematic above illustrates a pneumatic tire casing or carcass (10) in flat band form prior to being deformed into a doughnut shape or

MONSANTO RUBBER CHEMICALS ANSWER A FREQUENTLY ASKED COMPOUNDING QUESTION

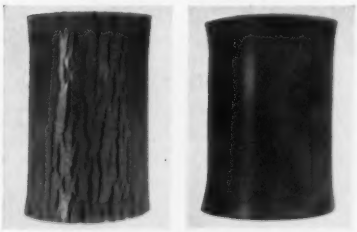
Monsanto helps you solve specific problems... chemicals...gives you the benefit of over 18,000 works from basic knowledge of more than 85 rubber compounding studies and 30 years of experience.

QUESTION: *What new, solid antiozonant guards rubber against ozone cracking with minimum staining ???*

ANSWER: *New Santoflex GP*

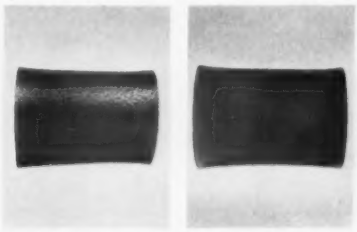
Monsanto announces Santoflex GP—the newest and best antiozonant you can use to "vaccinate" rubber against ozone attack. "GP" shows minimum staining. Now you can benefit from an antiozonant in mechanical goods and other industrial products just as tiremakers do in their compounds...Santoflex GP gives prolonged crack resistance to belting, electrical insulation, motor mounts, hose and appliance parts. An easily handled solid, "GP" imparts excellent ozone resistance.

Static Ozone Test (48 Hours)



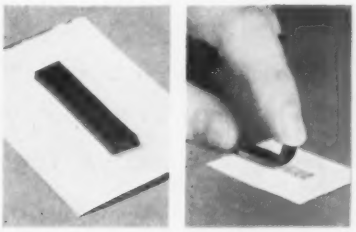
No antiozonant | Santoflex GP

Dynamic Ozone Test (36,000 Flexes—48 Hours)



No antiozonant | Santoflex GP

Migration Stain Test



(ASTM Test D-925-55, Method B)

See the difference 2-PPH Santoflex GP makes on SBR-1500 in a typical compound. Stocks exposed to approximately 50 parts of ozone per 100 million parts of air at 100° F. for 48 hours show how Santoflex GP substantially retards ozone cracking—yet they show only slight staining of a white auto lacquer.

SEND COUPON FOR SAMPLE...TECHNICAL HELP. Every application, plant and process has different compound requirements. That's why Monsanto recommends no "canned" formulations or "cure-alls"—we do offer samples of Santoflex GP along with technical help in testing it out for your specific application. The coupon is for your convenience.

SANTOFLEX: MONSANTO T. M., REG. U. S. PAT. OFF.

Monsanto®

MONSANTO CHEMICAL COMPANY
Rubber Chemicals Department, Akron 11, Ohio

Please send me a sample of new Santoflex GP.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

VULCANIZED VEGETABLE OILS

rubber substitutes

THE CARTER BELL MFG. CO.
SINCE
CARTER BELL PRODUCTS
1903
SPRINGFIELD, NEW JERSEY

Types, grades and blends for every purpose, wherever Vulcanized Vegetable Oils can be used in production of Rubber Goods—be they Synthetic, Natural, or Reclaimed.

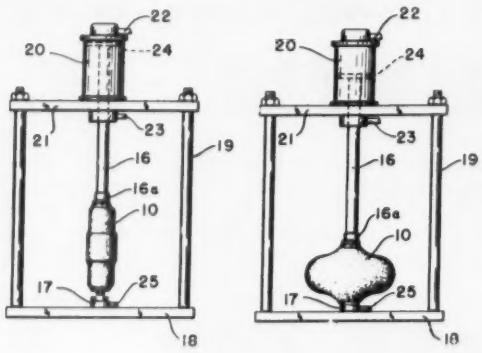
A long established and proven product

THE CARTER BELL MFG. CO.
SPRINGFIELD, NEW JERSEY

Represented by
HARWICK STANDARD CHEMICAL CO.
Akron, Boston, Chicago, Los Angeles, Trenton, Albertville, (Ala.), Dexter, Greenville, (S.C.)

toroidal form necessary for vulcanization of the casing. A portion of the shaping apparatus is located within the interior of the tire carcass and consists of an upper head (12) and a lower head (13) for engaging the rim portions of the carcass. Between the upper and lower heads is a flexible, expansible cylindrical member (14) of natural or butyl rubber. The cylindrical member functions as a shaping and curing bag when fluid pressure is applied to the interior of the bag through a valve mechanism (15) in the lower head. The upper head is connected to a hydraulic plunger or ram (16) through a swivel (16a) and the lower head fits into a stationary cup or receptacle (17).

As shown at the left of the diagram below, the receptacle (17) is fastened to a stationary platen



(18) of a conventional press structure (19) and the plunger (16) moves in a cylinder (20) carried by an upper platen (21) of the press. Fluid connections (22 and 23) feed fluid into the cylinder (20) on opposite sides of a piston (24) secured to the ram (16). The arrangement is such that by feeding fluid under pressure or vacuum to opposite sides of the piston it is possible to lower and raise the ram (16) to deform the shaping apparatus and tire carcass.

The diagram at left illustrates the tire carcass mounted on the shaping apparatus ready to be shaped upon downward movement of the ram (16) and at right shows the tire carcass in partially shaped condition. During the shaping operation fluid under pressure is applied to the interior of the curing bag (14) from a supply pipe (25) connected to the receptacle (17). After the tire carcass has been completely shaped to toroidal form, the tire carcass, with the shaping apparatus mounted in it, is removed from the press (19) and may be set aside until such time as it is to be placed in a conventional mold for vulcanization of the carcass.

After vulcanization of the tire casing, the latch-

H. MUEHLSTEIN & CO.
INC

60 EAST 42nd STREET, NEW YORK 17, N. Y.

REGIONAL OFFICES: Akron • Chicago • Boston • Indianapolis
Los Angeles • Toronto • London

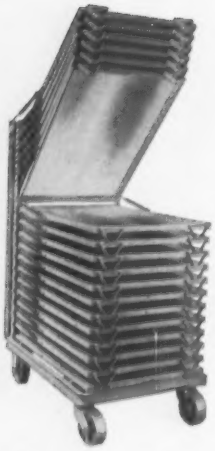
PLANTS AND WAREHOUSES: Akron • Chicago • Boston • Los Angeles
Jersey City • Indianapolis • Toronto

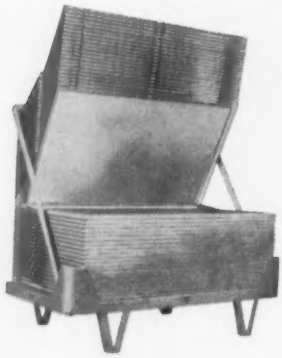
CRUDE RUBBER
SYNTHETIC RUBBER
SCRAP RUBBER
HARD RUBBER DUST
VIRGIN AND REPROCESSED PLASTICS

SPADONE

Spring Leaf Trucks

are cutting costs throughout the Tire and Rubber Industry





Facilitate Storage, Cooling and Drying. Expedite Handling and Processing.

Afford Extra Protection for Materials.

Conserve Valuable Floor Space.

Provide Long and Maintenance - Free Service.

For:

- Tire Treads
- Plastics
- Solings
- Tilings
- Adhesives
- Backing
- Mill Batches
- Calender Stock

SPADONE TRUCKS are available in Standard and Special Models or furnished to your individual specifications. Write for detailed information. Our Engineering staff will be pleased to help with your requirements.

SPADONE MACHINE CO. INC.

SOUTH NORWALK, CONNECTICUT Phone: VOlunteer 6-3394

PATENT REVIEW

ing mechanism holding the two heads together may be released by squeezing the heads together slightly. To remove the curing bag from the interior of the tire carcass the assembly is again mounted between the lower receptacle and the plunger. Upon gradual raising of the plunger the heads are separated and the curing bag withdrawn from the interior of the tire casing. If desired, a vacuum may be applied to the interior of the curing bag by making a suitable connection to the fluid supply pipe to aid in collapsing the bag.

Manufacture of Asphalt-Rubber Blends

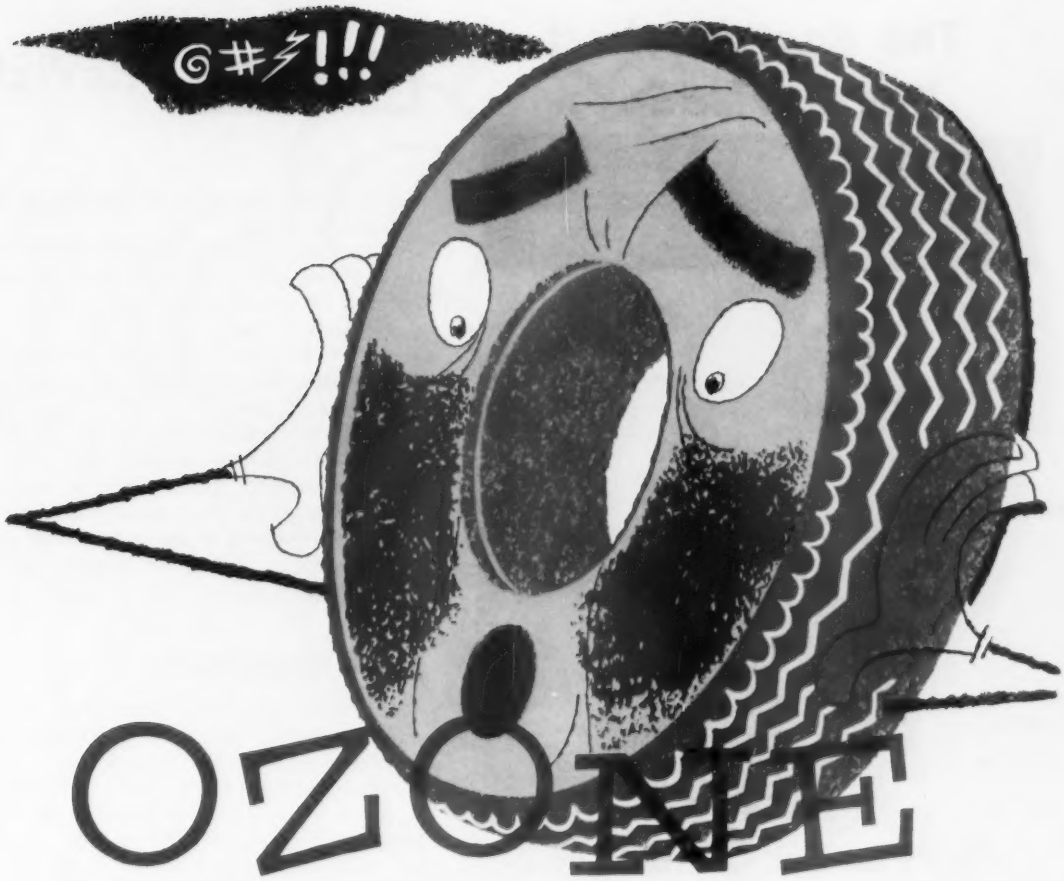
U.S. Patent 2,830,963, issued April 15, 1958 to Ralph N. Traxler and Clarence E. Wilkinson, assigned to The Texas Co., describes a process for manufacturing rubber-asphalt paving mixtures characterized by improved ductility and low temperature properties.

Rubber is incorporated into asphalt in the form of a latex consisting of 15 to 55% solids and 45 to 85% water with the resulting formation, after water removal, of an asphalt-rubber blend containing 1 to 3.5% by weight of rubber. The large water content of the latex poses several problems which are solved by this invention. It has been found necessary to observe certain critical conditions, consisting of a rubber blend of 1 to 3.5 weight per cent, a temperature range of 275 to 375°F., substantial surface evaporation of the water content of the latex by adding it at a rate of 0.02 to 0.5 gallons per minute per square foot of surface in the mixing vessel, and maintenance of the asphalt viscosity below 100 seconds Furol at the temperature of latex addition. An advantage of this process is the decreased amount of rubber required.

Porous Sheet Material

U.S. Patent 2,832,997, issued May 6, 1958 to Kenneth E. Bristol, assigned to The Goodyear Tire & Rubber Co., relates to a process for manufacturing a leather substitute from a foamed latex and a fibrous material distributed randomly throughout the foam.

A rubber latex is compounded with conventional rubber latex compounding ingredients, and is then frothed to the desired density. The fibrous material is added during the frothing operation and then the gellant materials are added and the mixture is spread upon a casting surface such as an endless belt, into a sheet of any desired thickness, by passing the frothed latex under a spreader knife. The frothed latex is then gelled, washed,



is a nasty word to rubber!

Ozone cracking in rubber is expensive, in sales lost and user dissatisfaction. Protect your rubber products from this danger with Universal's high potency antiozonants, UOP 88 and UOP 288.

Developed by Universal, these antiozonants have proven that they can provide complete protection to tires, or other rubber products under both dynamic and static exposure.

We'll be glad to recommend the best UOP 88 or 288 formulation to protect your product from ozone cracking and help it maintain the appearance and the service built into it.

UOP 88® and 288
TRADEMARK
RUBBER ANTIOZONANTS

UOP®

PRODUCTS DEPARTMENT

UNIVERSAL OIL PRODUCTS COMPANY

30 ALGONQUIN ROAD
DES PLAINES, ILLINOIS, U. S. A.

The Best Method Yet Devised . . .

FOR DICING SHEET STOCK

The Famous CUMBERLAND "Stair-Step" Dicer

Here at last is the answer to your problems of dicing rubber or vinyl sheet stock. Produces perfect cubes ranging in size from ⅛ to ½" by merely changing knives.

Comes in two sizes designed to handle sheets up to 7" or 14" in width. Other sizes made to order.

Input speeds range from 10 to 125 feet per min. depending on material and size of cube desired.

The CUMBERLAND Rotary Chopping and Dicing Machine

As a chopper, this machine efficiently cuts rubber and vinyl slabs into small pieces. Two sizes available to handle stock widths up to 14 or 24 inches.

As a dicer in modified form, handles principally vinyl sheet stock. A less expensive machine though less universal than the "Stair-Step" Dicer shown above.

For Granulating Plastic . . .

Investigate Cumberland's complete line of granulating machines. Request Bulletin 260.

Write for Complete Information

CUMBERLAND Engineering Co. Inc.
DEPT. S · BOX 216 · PROVIDENCE · RHODE ISLAND
Builders of Better Machines for the Rubber and Plastics Industry

PATENT REVIEW

and partially crushed to a thickness of ⅛-inch, to facilitate drying.

A coating may be applied to the sheet before drying. For example, a solution of nylon in alcohol may be applied to the surface of the wet, partially crushed sheet and permitted to set with the drying of the foam. The dried, partially crushed sheet is then further crushed during curing under a pressure of from 10 to 300 pounds and from 20 to 50 psi at a temperature of 290 to 320°F. for a time sufficient to bring about the desired state of cure. The product may be used in making shoe uppers in place of natural leather, as an upholstery material in the manufacture of chairs and davenports, and in the manufacture of brief cases and luggage.

Grain-free Polystyrene Latices

U.S. Patent 2,842,511, issued July 8, 1958 to Ernest A. Sutton and Costas H. Basdekis, assigned to Monsanto Chemical Co., describes a process for obtaining grain-free polystyrene latices.

About 0.1 to 2.0 parts by weight of a diatomaceous earth (70% being larger than ten microns) are mixed with 100 parts by weight of a 45 to 60% solids aqueous polystyrene latex containing oversize grains with a particle size of at least 0.5 micron. It is then possible to filter out the diatomaceous earth and the oversize grains.

Other Patents Of Interest

Subject	Assignee	Patent No.	Date
Prevention of die-facing of thermoplastic filaments.	Firestone Tire & Rubber Co.	2,821,744	2/4/558
Tire lifting mechanism for dual vulcanizing presses	McNeil Machine & Engineering Co.	2,836,847	6/3/58
Tire retreading mold	Paul E. Hawkinson Co.	2,836,854-5	6/3/58
Drive mechanism for a rubber mill	Farrel-Birmingham Co., Inc.	2,837,763	6/10/58

Copies of any patents, including those described here, are available from the Commissioner of Patents, Washington 25, D. C., for 25 cents each. Do not send stamps.

COPO®

means PIONEERING in cold rubber...

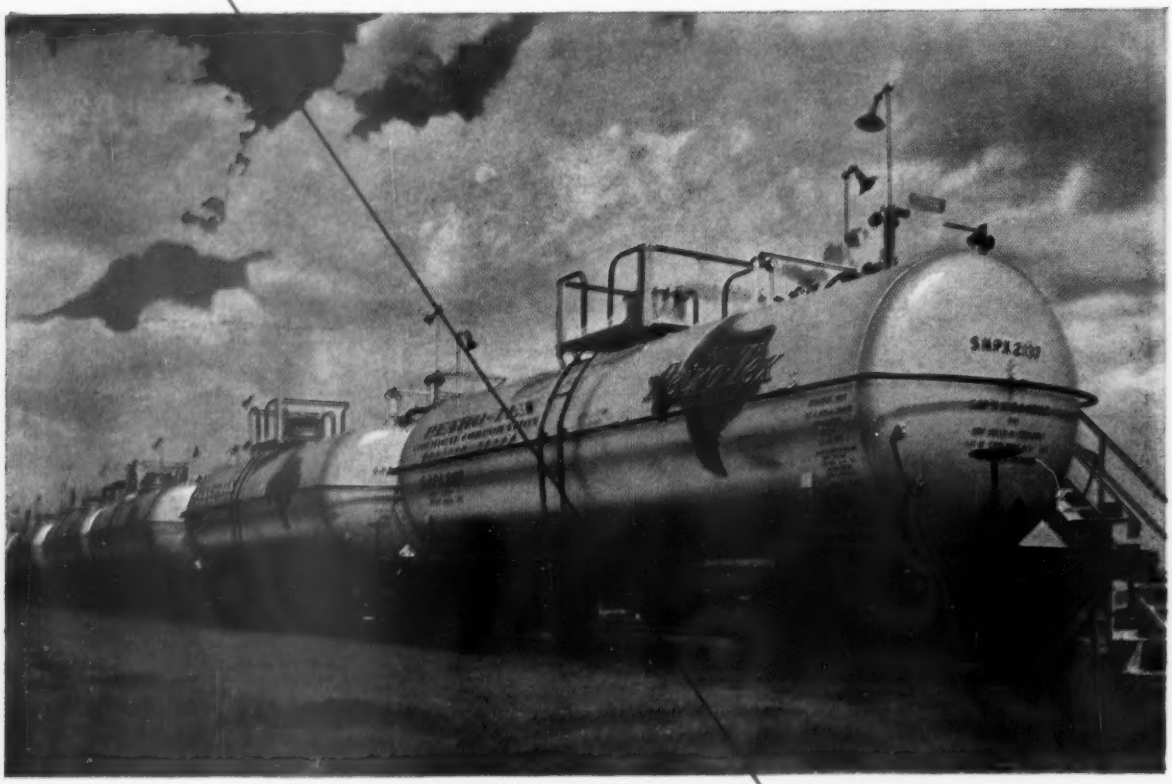
and pioneering means maintaining a CONSTANT LOOKOUT
FOR WAYS TO IMPROVE OUR PRODUCTS AND SERVICE

uniformity • well-packaged • good service • high quality

COPOLYMER RUBBER & CHEMICAL CORPORATION • BATON ROUGE 1, LOUISIANA COPOLYMER CRCC COLD RUBBER SPECIALISTS

New high-purity n-BUTENE-1 (95% mininum)

highly reactive alpha olefin
never before commercially available



Heretofore available only at 65% purity or as a component of mixed butylene streams, n-Butene-1 has not enjoyed the wide commercial use which the pure form of this reactive alpha olefin should now merit.

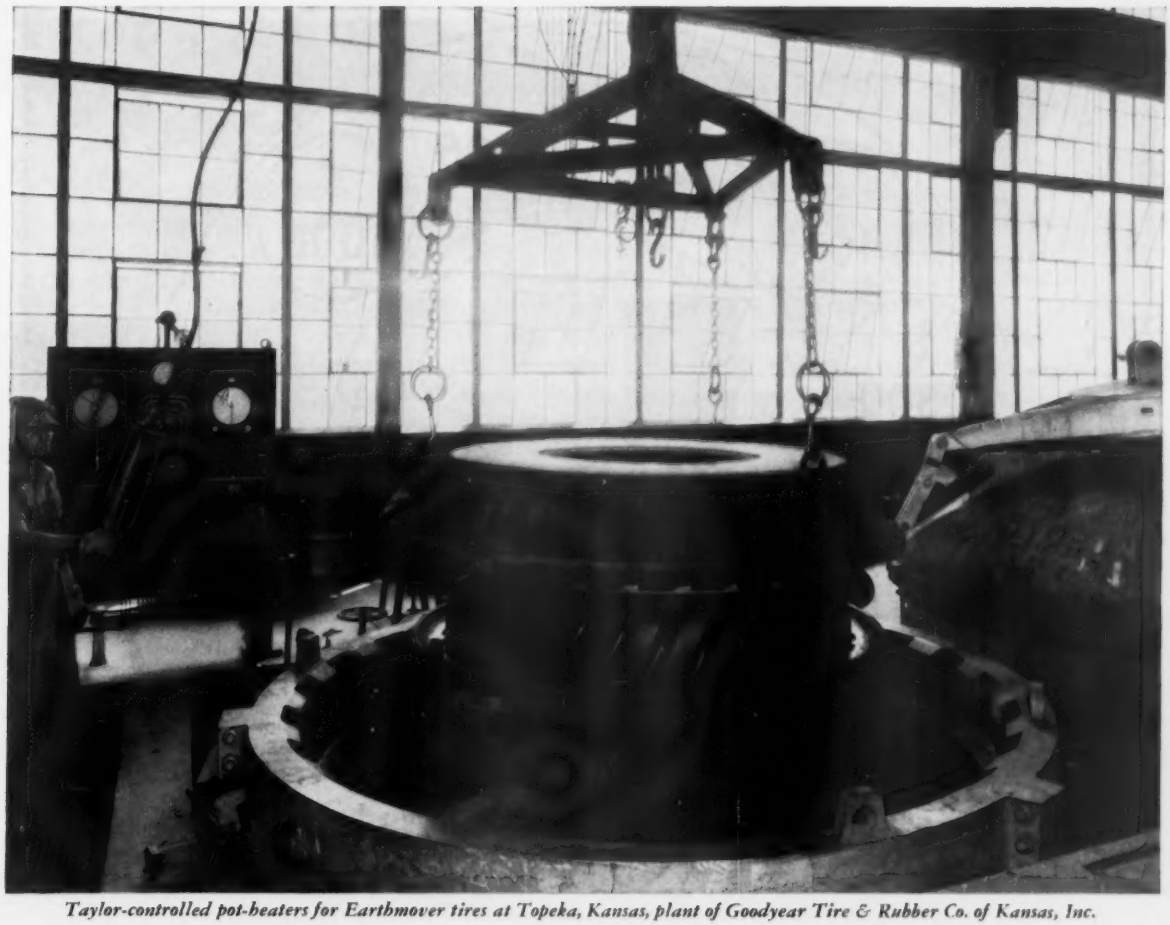
n-Butene-1 undergoes a wide range of interesting polymerization, copolymerization, hydration, alkylation, oxidation and hydroformylation (oxo process) reactions—many having significant commercial petrochemical possibilities.

Petro-Tex can make tank-car deliveries of 95% mininum purity n-Butene-1 from substantial continuous production. We will also welcome inquiries for tank-car or ocean tanker shipments of

n-BUTENE-2 (95% minimum purity)
DIISOBUTYLENE • TRIISOBUTYLENE • BUTADIENE

Petro-Tex®

PETRO-TEX CHEMICAL CORPORATION
HOUSTON 1, TEXAS
JOINTLY OWNED BY
FOOD MACHINERY AND CHEMICAL CORPORATION AND TENNESSEE GAS TRANSMISSION COMPANY



Taylor-controlled pot-heaters for Earthmover tires at Topeka, Kansas, plant of Goodyear Tire & Rubber Co. of Kansas, Inc.

Goodyear's tougher with Taylor

GOODYEAR "Earthmovers" are tougher because of Taylor precision controls on their pot-heaters. That's important because these 1600-lb. tires must carry mammoth loads and travel at speeds unknown to old-fashioned earth-moving equipment.

Goodyear officials say: "Properly controlled cure of Earthmover tires has first preference in the design of equipment." This meant ±1 degree in temperature . . . this meant ±1% in time . . . this meant Taylor Control Systems for fully automatic timing and temperature.

A Taylor FULSCOPE*Temperature Controller regulates the temperature. The complete cure is precision-timed by two Taylor FLEX-O-TIMERS*—a sequence timer for a range from two to 192 minutes and a cure timer having a range from 18 to 1,440 minutes.

THIS FULLY AUTOMATIC TIMING MEANS:

1. Improved tire quality—the automatic cure cycles *are uniform.*

2. Improved plant efficiency—automatic cure timing permits *closer scheduling of heats,* reduces idle time of equipment and operators.

3. Reduced processing costs—there's *no need for a "steam-tender"* to time curing stages.

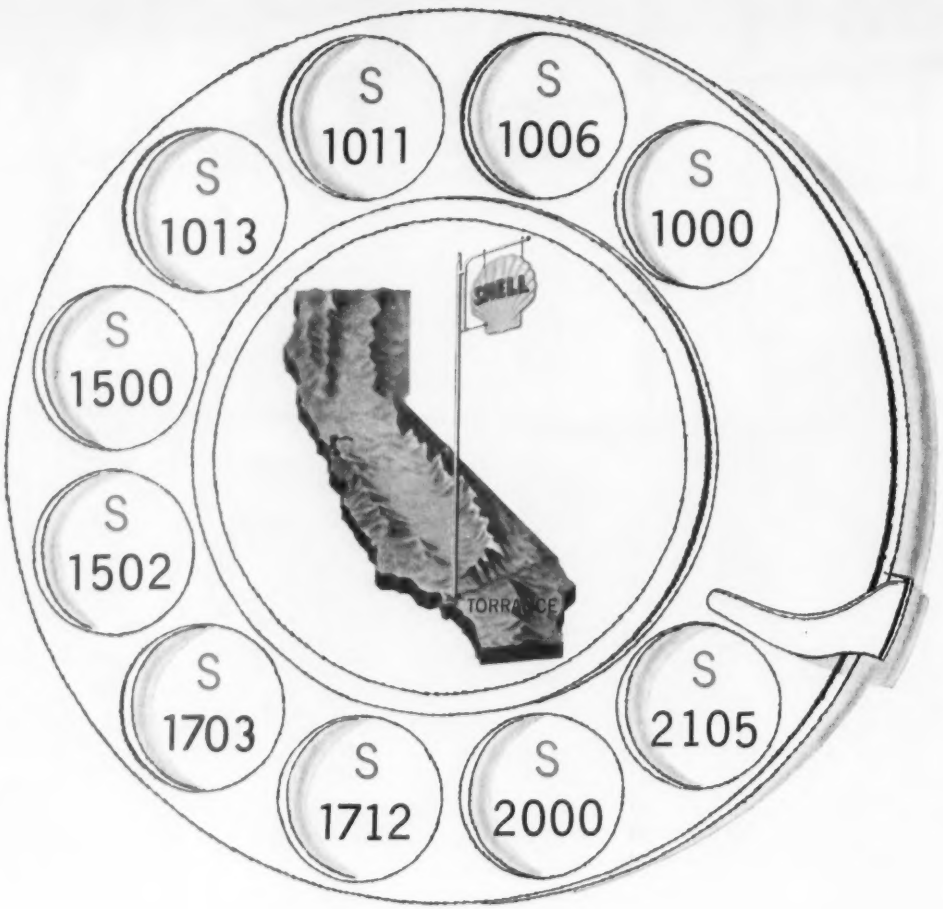
The man to suggest what Taylor Control Systems can mean in your plant is your Taylor Field Engineer. Or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Ontario.

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

*Reg. U.S. Pat. Off.

Taylor Instruments
MEAN
ACCURACY FIRST

VISION · INGENUITY · DEPENDABILITY



Pick a number—from 1000 to 2105

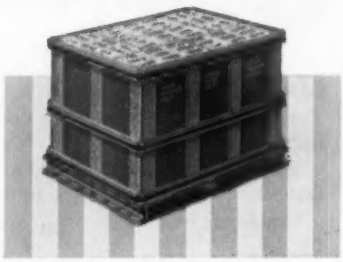
YOU ALWAYS WIN when you specify Shell's hot, cold, oil-extended polymers, black masterbatches, hot or cold latices.

When you need general purpose synthetic rubber, you're sure to win when you pick a number from Shell Chemical's catalog. And you can choose what you need from the widest variety of synthetic rubber available from a single source—Torrance, California.

In addition to full value for your money—in product and delivery—you benefit from one of the broadest research and development programs in the synthetic rubber industry. Improved quality, new polymers, and advances in packaging † help you make better products at lower cost.

Use Shell Chemical's Technical Service when you are searching for practical solutions to troublesome technical problems. Write today for full information . . . or better still, phone Los Angeles, FAculty 1-2340.

*Shell Chemical Trademark



† Shell offers you the Flotainer* package, a strong, lightweight, steel-strapped wooden container that holds 42 film-wrapped bales. The "Flotainer" controls cold flow in uncured synthetic rubber; prevents contamination; simplifies and speeds handling; lets you store 20 tons of rubber on less than 100 sq. ft. of floor space. Write for an illustrated bulletin on this packaging innovation.

SHELL CHEMICAL CORPORATION

SYNTHETIC RUBBER SALES DIVISION
P. O. BOX 216, TORRANCE, CALIFORNIA

SHELL

Capitol Cues

CORPORATE PROFITS WILL REALLY ZOOM the rest of this year and in '59. Economists expect industry's earnings to move up even faster than they fell during the worst of the recession. (They were down 30% by last January.) By year-end, three quarters of the earnings loss will have been recovered. By next Spring, profits should again top the $46 billion rate of late 1956.

Rising sales are bringing production back to well above the "break-even" point for many lines. Put another way, rising productivity means lower unit costs, bigger profit margins. Some of the biggest gains are coming in the lines that were hardest hit by recession—but this isn't always the case.

Here's the profits outlook, industry by industry:

- Large gains are developing in profits of the railroad, oil, construction materials, aircraft, electrical equipment, and tire makers, textiles, iron and steel, and in automobiles.
- Smaller hikes—though still solid ones—are coming in food, beverages, and tobacco, drugs and cosmetics, transportation equipment, utilities, nonferrous metals, and the chemicals.

THE SECOND PHASE OF THE COUNTRY'S BUSINESS RECOVERY is now beginning. The things that got the upturn started are still supplying plenty of steam. But they've begun to generate secondary effects, reinforcing the first lift. As a result, economists are convinced that this recovery will go pretty far. In the experts' opinion, there's virtually no chance of a sudden set-back.

The first phase of recovery has taken the economy back some 75% of the way to the pre-recession peak. It was prompted by an expansion in home-building, a rise in federal spending, and steady increases in consumer buying. Stock market jumps helped by increasing consumer and business confidence.

The second phase of the upturn will bring business activity to a new record—possibly before 1958 is over. Efforts to rebuild depleted inventories and new interest in expansion ...both powerful stimulators...will be the dynamic factors.

The third phase will come in the Spring of 1959, and usher in a period of new records. Some economists think we may see an all-out boom; others just see steady, solid growth.

DON'T LOOK FOR NEW STEPS TO TIGHTEN CREDIT to be taken soon by the authorities in Washington. But this doesn't mean money won't get tighter. Officials at the Federal Reserve think they have done all that's necessary to keep a rein on the boom. They're ready to let natural forces do the job for a while. These forces include rising need for inventory loans, demand for expansion capital, and the government's borrowing to meet the deficit.

DEMAND FOR ENGINEERS AND TECHNICIANS will soon be on the rise again, say federal personnel experts. Two or three years ago, new graduates had their pick of jobs. But the recession, and cuts in defense spending, cut demand. Now the picture has changed back with the growing missile programs.

(Continued on Next Page)

A PICK-UP IN U.S. FOREIGN TRADE is under way—another by-product of the business recovery. Other countries let their stocks of U.S. goods run down during the late recession, and now must restock. In addition, they are getting more dollars because—with better times—Americans buy more abroad.

Here's the outlook as government trade specialists see it:
- U.S. exports will rise 3% or 4% in months ahead. Machinery sales will go up 5%, grains 2%, chemicals, 4%, metals, 10%.
- U.S. imports will climb even more—cars, coffee, newsprint.

A SYSTEM FOR INTERCHANGING TRUCK-TRAILERS, recently approved by the Interstate Commerce Commission, promises substantial benefits for shippers—as well as stiffer competition for the railroads. The new program will let truckers exchange trailers the way railroads lend each other freight cars. Shippers will benefit through faster service and less damage in rehandling. The plan is scheduled to go into operation some time in the Spring of 1959.

USE OF ELECTRONIC BRAINS TO CHECK TAX RETURNS and spot more evaders will be started by Internal Revenue Service in 1959—with individual returns of 1958. The first task of the new "electronic data processors" will be to select for more intensive audit those returns that may be out of line in some respect. Then the machines will use "taped-in" standards for testing the reasonableness of itemized personal deductions...travel expenses...large losses or sick pay exclusions...and unusually large numbers of exemptions.

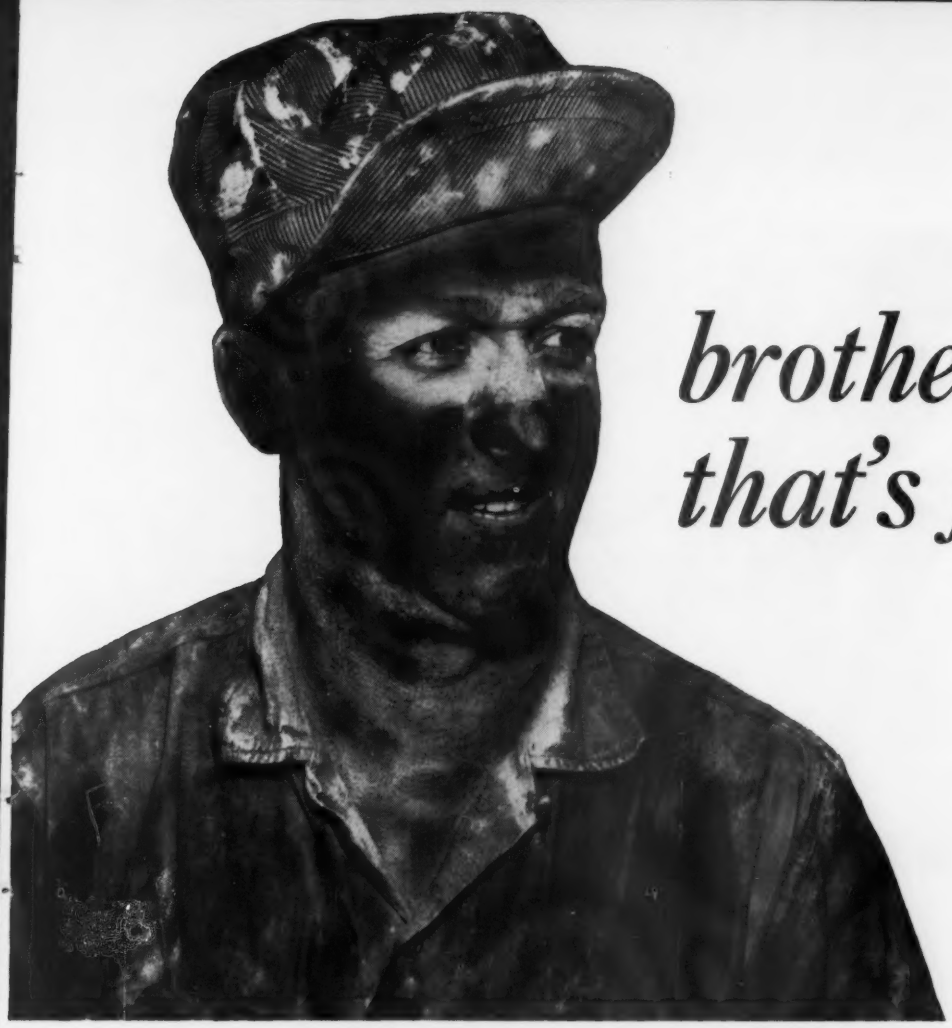
Revenue officials hope to increase the number of individual returns that can be audited annually. Later on, they expect to handle returns of corporations—perhaps by 1960 or 1961.

WHAT WILL THE NEW CONGRESS JUST ELECTED do for...or to ...business? The question was put to Congressional leaders after the votes were tallied. In their opinion, the bigger Democratic majorities foreshadow less sympathy for the business viewpoint on Capital Hill. But the fact that conservative Southerners will still run committees will block ultra-New Deal type laws.

Here's the kind of thing the leaders see ahead—
- On labor, Democrats will work for mild racketeering curbs—to block really tight laws—and a hike in the minimum wage.
- On antitrust, Democrats will push a bill making merging firms notify Justice in advance. A U.S. Fair Trade law will fail.
- On spending, though farm aid and the recession programs will shrink, housing and foreign aid expenditures will increase.
- On taxes, you'll hear much on increases to fight inflation, but conservatives will head off any major readjustments.
- On regulation, there probably won't be any easing of rules governing renegotiation of Federal contracts, while Federal Trade, Federal Communications, etc., may get bigger powers.

And there will be plenty of investigations—on industry's pricing and sales to government, and on inflation's threat.

SMALL FIRMS WILL BE ABLE TO GET ADVICE as well as special financing from the new Small Business Investment Companies which will soon get rolling The law permits these new financial institutions to provide consultations. They must dig to check on borrowers, and can counsel on problems uncovered.



brother, that's for me!

New AMERIPOL MICRO-BLACK banishes black mess, boosts Banbury output 25% or more

Why mess with the handling, storage, weighing, milling and mixing of carbon black? You can eliminate all those operations, and thereby increase your Banbury mixer output 25% or more, with new Ameripol Micro-Black masterbatch in your recipe. Here's why.

Carbon black is already integral in the Micro-Black masterbatch. You not only cut out all those processing costs, but you get cleaner, faster production. Warehousing is simplified because you eliminate one raw material. Handling is also simplified because Micro-Black masterbatch is shipped bareback.

You get superior carbon black dispersion and therefore greater abrasion resistance in your finished rubber products when you use Ameripol Micro-Black. For Goodrich-Gulf has achieved the ultimate in carbon dispersal with "high liquid shear agitation" at the latex stage.

Try a ton of Micro-Black at our risk! Use it to make your product—then compare results with present production. If you don't agree that Micro-Black gives you superior dispersion, reduces handling time and costs, the test ton costs you nothing! Write, phone or use coupon below.

Goodrich-Gulf Chemicals, Inc.

GOODRICH-GULF CHEMICALS, INC.
Dept. MB-4, 3121 Euclid Avenue, Cleveland 15, Ohio

- ☐ Count me in on your Try-a-Ton Test.
- ☐ Send me Ameripol 4650 (55 part H.A.F. black).
- ☐ Send me Ameripol 4651 (62½ part H.A.F. black).
- ☐ Phone me for shipping instructions.

Name_____

Title_____

Company_____

Address_____

City_____ Zone_____ State_____

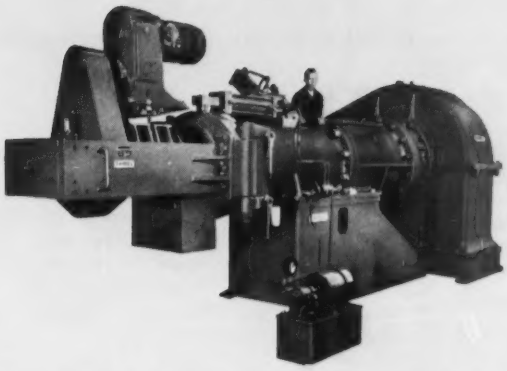
TITANOX* to the rescue! Part of the appeal of vinyl-covered furniture lies in its light or pastel finish . . . and part of the appeal of TITANOX titanium dioxide white pigments is how economically they produce properties of whiteness, brightness and opacity in plastic or rubber stocks. Whether your formula calls for TITANOX-RA, TITANOX-RA-50 or TITANOX-RA-NC, you'll find these leading white pigments a pleasure to work with—in uniformity that permits easy regulation of opacity and tint, in the contribution they make to product durability, and in ease of processing. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices and warehouses in principal cities.

TITANIUM PIGMENT CORPORATION

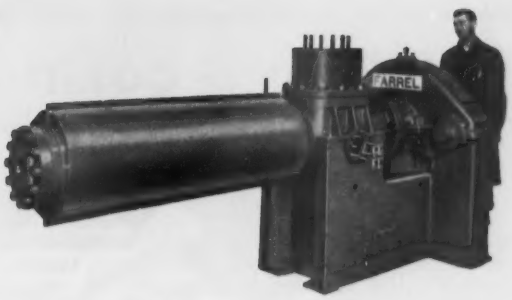
Subsidiary of **NATIONAL LEAD COMPANY**

*TITANOX is a registered trademark for the full line of titanium pigments offered by Titanium Pigment Corporation.

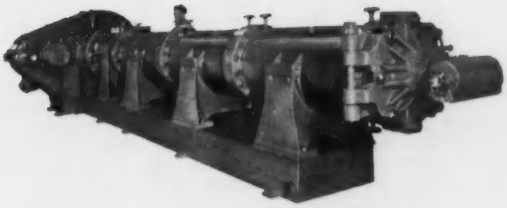
5728



Newest design 18" pelletizer for use with high-speed, high-pressure Banbury mixer. Will deliver the batch of a size 11 Banbury in 45 seconds. New end-discharge type with variable-speed knife to regulate length of cut. Hopper has underfeed pusher to hasten feed to screw.



8" x 4½" extruder designed to work and cool hot polyethylene received from the processing line at 400 to 500° F. Delivers stock at a constant rate for pelletizing. Capable of a production rate of 1500 to 2500 lbs. per hour, depending on operating speed.



This 12" cold-fed extruder will continuously work polyethylene and deliver the stock in a strained condition through downward-discharge strip die at a rate of 3000 lbs. per hour. Driven by a 600-HP constant-speed motor, variations in speed are obtained with a hydraulic coupling.

How Farrel can help you get the exact extruder to fit the job

In recent years, Farrel has built a great many extrusion machines in a broad range of designs and sizes. This experience is the basis of the company's three-part program which can assist you in developing new products or new processing techniques involving the extrusion of rubber, plastics and other materials.

1. **ENGINEERING ASSISTANCE** — Farrel engineers are "on call" for consultation or engineering assistance in the development of unit operations or complete processing setups.

2. **INDIVIDUALIZED EXTRUDER DESIGN** — As any one of the hundreds of extruders built to date is adaptable in critical detail to a wide variety of requirements, and as special machines can be designed to meet unique conditions, developing the unit you need should seldom be difficult and never impossible.

3. **PROCESS LABORATORY** — A completely equipped laboratory, with a full complement of both experimental and factory-size machines, available for process testing your own materials.

Send for further details of this three-part program.

FARREL-BIRMINGHAM COMPANY, INC.

Engineers and Builders of Heavy Machinery
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, Akron, Chicago, Ann Arbor (Mich.), Los Angeles, Houston, Fayetteville (N. C.)
European Office: Piazza della Republica 32, Milano, Italy

Farrel-Birmingham®

FB-1155

COMING EVENTS

Dec. 26-31, 1958. American Association for the Advancement of Science, 125th Annual Meeting, Washington, D. C.

Jan. 15, 1959. Quebec Rubber & Plastics Group, Joint Meeting with Society of Plastics Engineers, Montreal, Canada.

Jan. 23, 1959. Akron Rubber Group, Sheraton Hotel, Akron, Ohio.

Jan. 23, 1959. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Jan. 26-29, 1959. Plant Maintenance & Engineering Show, Public Auditorium, Cleveland, Ohio.

Jan. 29-30, 1959. Southern Rubber Group, Statler Hilton Hotel, Dallas, Texas.

Jan. 30, 1959. Chicago Rubber Group, Furniture Club, Chicago, Ill.

Jan. 30-31, 1959. Southern Rubber Group, Statler-Hilton Hotel, Dallas, Texas.

Feb. 2, 1959. Washington Rubber Group, Army-Navy Club, Washington, D. C.

Feb. 2-6, 1959. ASTM Committee Week, Penn - Sheraton Hotel, Pittsburgh, Penna.

Feb. 3, 1959. Los Angeles Rubber Group, Biltmore Hotel, Los Angeles, Calif.

Feb. 4-6, 1959. American Society for Testing Materials, Committee D-11, Pittsburgh, Penna.

Feb. 6-8, 1959. Boston Rubber Group, Annual Ski Week-End, White Mountains, N. H.

Feb. 12, 1959. Fort Wayne Rubber & Plastics Group, Winter Meeting, Van Orman Hotel, Fort Wayne, Ind.

Feb. 18-21, 1959. International Automotive Service Industries, Navy Pier, Chicago, Ill.

Feb. 27, 1959. Quebec Rubber & Plastics Group, Ladies Night Dance, Victoria Hall, Montreal, Canada.

March 3, 1959. Buffalo Rubber Group Spring Meeting, Hotel Westbrook, Buffalo, N. Y.

March 13, 1959. Chicago Rubber Group, Furniture Club, Chicago, Ill.

March 19, 1959. Quebec Rubber & Plastics Group, "Rubber & Plastics in Automotive Application," Montreal, Canada.

March 20, 1959. New York Rubber Group, Technical Meeting, Henry Hudson Hotel, New York, N. Y.

April 3, 1959. Akron Rubber Group, Sheraton Hotel, Akron, Ohio.

April 16, 1959. Fort Wayne Rubber & Plastics Group, Spring Meeting, Van Orman Hotel, Fort Wayne, Ind.

April 16, 1959. Quebec Rubber & Plastics Group, "Rubber & Plastics Extrusion," Montreal, Canada.

April 24, 1959. Chicago Rubber Group, Furniture Club, Chicago, Ill.

May 1, 1959. Joint International Meeting, Buffalo Rubber Group-Ontario Rubber Section, C.I.C., Hotel Sheraton-Brock, Niagara Falls, Ont.

May 1, 1959. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

May 12-15, 1959. Division of Rubber Chemistry, A.C.S., Spring Meeting, Biltmore Hotel, Los Angeles, Calif.

June 4, 1959. New York Rubber Group, Summer Outing.

June 5, 1959. Fort Wayne Rubber & Plastics Group, Summer Outing.

June 5, 1959. Quebec Rubber & Plastics Group, Golf Tournament.

June 9, 1959. Buffalo Rubber Group, Golf Outing, Lancaster Country Club.

June 9-12, 1959. Material Handling Institute Exposition, Public Auditorium, Cleveland, Ohio.

June 12-14, 1959. Southern Rubber Group, Desert Ranch, St. Petersburg, Fla.

June 19, 1959. Akron Rubber Group, Summer Outing, Firestone Country Club, Akron, Ohio.

June 21-26, 1959. ASTM Annual Meeting, Chalfonte - Haddon Hall Hotel, Atlantic City, N. J.

Aug. 4, 1959. New York Rubber Group, Golf Tournament.

Sept. 13-17, 1959. National Tire Dealers & Retreaders Association, Annual Convention, Washington, D. C.

Sept. 24, 1959. Fort Wayne Rubber & Plastics Group.

Oct. 13, 1959. Buffalo Rubber Group, Fall Meeting, Hotel Westbrook, Buffalo, N. Y.

Oct. 16, 1959. New York Rubber Group, Fall Meeting, Henry Hudson Hotel, New York, N. Y.

Oct. 19-21, 1959. Ninth Canadian High Polymer Forum, Guild Inn, Toronto, Ont., Canada.

Oct. 23, 1959. Akron Rubber Group, Sheraton Hotel, Akron, Ohio.

Nov. 9-13, 1959. Joint International Meeting of Division of Rubber Chemistry, A.C.S.; Committee D-11, A.S.T.M., and Rubber and Plastics Division, A.S.M.E., Shoreham Hotel, Washington, D. C.

Dec. 3, 1959. Fort Wayne Rubber & Plastics Group.

Dec. 18, 1959. New York Rubber Group, Xmas Party.

Jan. 29, 1960. Akron Rubber Group, Sheraton Hotel, Akron, Ohio.

Feb. 11, 1960. Fort Wayne Rubber & Plastics Group.

April 8, 1960. Akron Rubber Group, Sheraton Hotel, Akron, Ohio.

April 14, 1960. Fort Wayne Rubber & Plastics Group.

May 24-27, 1960. Division of Rubber Chemistry, A.C.S., Spring Meeting, Statler Hotel, Buffalo, N. Y.

June 17, 1960. Akron Rubber Group, Summer Outing, Firestone Country Club, Akron, Ohio.

Sept. 13-16, 1960. Division of Rubber Chemistry, A.C.S., Fall Meeting, Commodore Hotel, New York, N. Y.

May 16-19, 1961. Division of Rubber Chemistry, A. C. S., Spring Meeting, Brown Hotel, Louisville, Ky.

Sept. 5-8, 1961. Division of Rubber Chemistry, Fall Meeting, Sherman Hotel, Chicago, Ill.

Man's urge to progress brings many changes . . . from chain drive and solid tires to Diesels and smooth-running pneumatics, for example. But there are some things which never change . . . Among these is the hope expressed in the thought —

"and on earth peace, good will toward men."

May your Holidays be most pleasant and may the New Year bring you great happiness.

UNITED CARBON COMPANY, INC.

KOSMOS is the key word for carbon black when the aim is superior reinforcement.

KOSMOS Blacks are produced scientifically in 15 types by furnace and channel processes from carefully selected oils and from natural gas.

KOSMOS Blacks rate high for safe, easy processing; fast, tight cure; maximum reinforcement and equally high resistance to wear, tear, flex and aging.

KOSMOS Blacks are up to date in quality, highly uniform, and designed to strengthen rubber for exceptional service. They have been used world-wide for decades to give better performing rubber.

There is a **KOSMOS** Black to suit the most discriminating compounder, meeting his requirements for every type rubber and practically every application.

Avoid doubt. Standardize on **UNITED CARBON BLACKS.**

UNITED CARBON COMPANY, INC.

A subsidiary of United Carbon Company

CHARLESTON 27, WEST VIRGINIA

NEW YORK AKRON CHICAGO
BOSTON LOS ANGELES MEMPHIS

IN CANADA: CANADIAN INDUSTRIES LIMITED

ANIC

ITALY

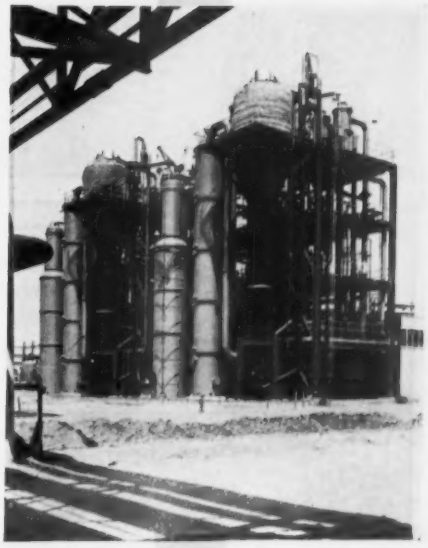
ANIC PETROCHEMICAL PLANT
RAVENNA, ITALY

Synthetic rubber

EUROPRENE

BUTADIENE - STYRENE

COLD RUBBERS	HOT RUBBERS
EUROPRENE 1500	EUROPRENE 1000
" 1502	" 1001
" 1503	" 1006
" 1708	" 1009
" 1712	" 1018

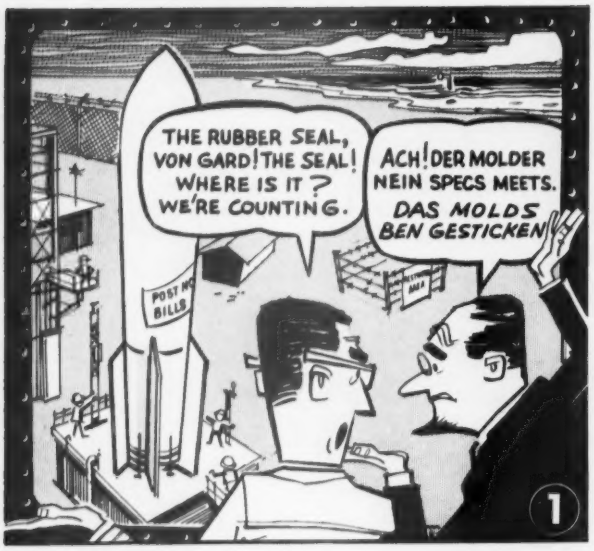


HEAD OFFICE: **SAN DONATO MILANESE, MILAN, ITALY**
SOLE AGENTS:
AUSTRIA: GEBRUDER SCHOELLER - 3, RENNGASSE, WIEN 1
BENELUX AND SCANDINAVIA: LEWIS & PEAT (HOLLAND) N. V. - 484, HEERENGRACHT, AMSTERDAM C
FRANCE: S. A. F. I. C. ALCAN & CIE - 11, AVENUE KLEBER, PARIS 16E
GERMANY: NORDMANN, RASSMANN & CO - 49, DEICHSTRASSE, HAMBURG 11

AGENT 36
SILICONE SQUAD

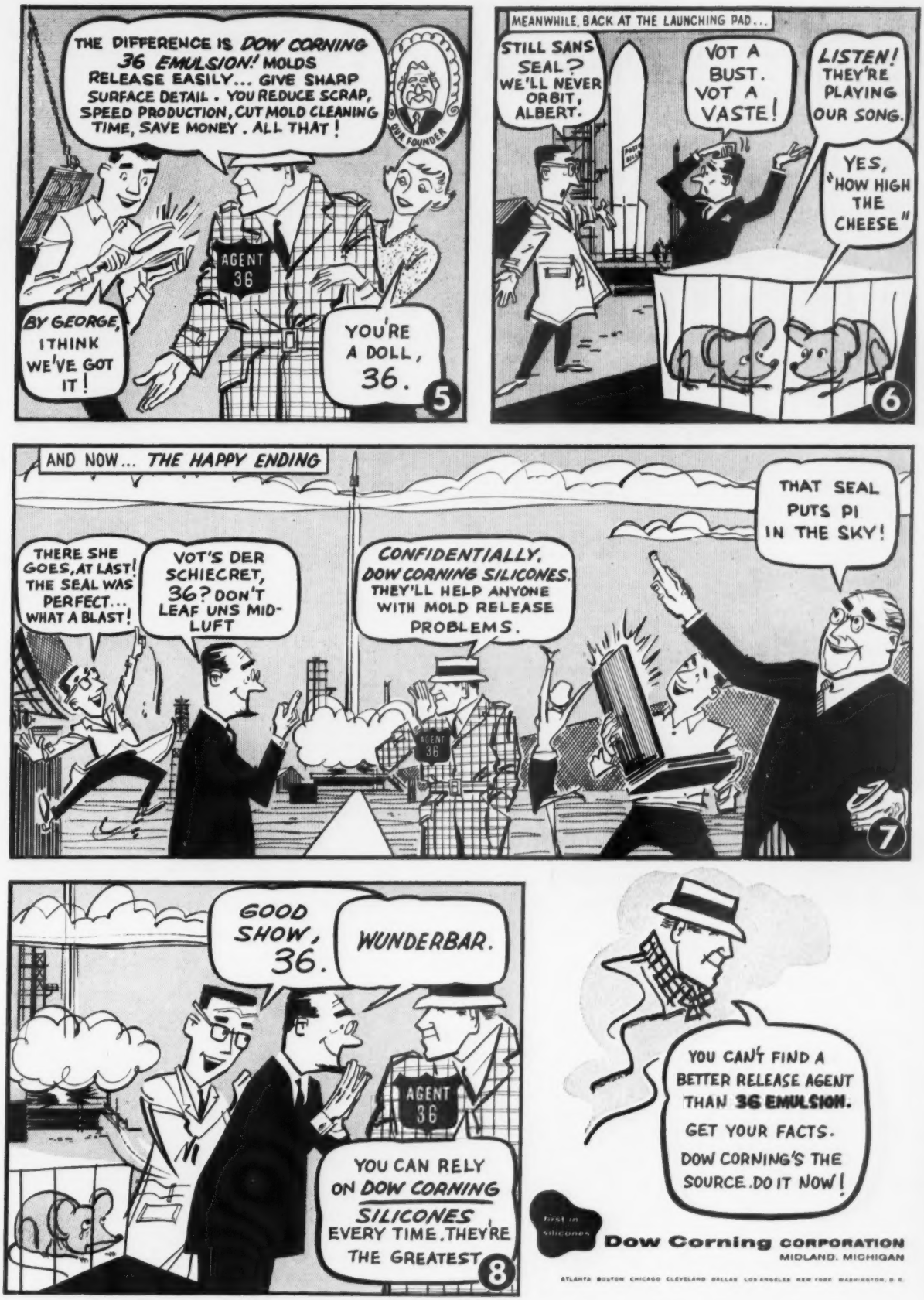
HOW I KEPT A LAUNCHIN' DATE

FROM THE OFFICIAL FILES OF DOW CORNING


THE RUBBER SEAL, VON GARD! THE SEAL! WHERE IS IT? WE'RE COUNTING.
ACH! DER MOLDER NEIN SPECS MEETS. DAS MOLDS BEN GESTICKEN
POST NO BILLS
1

MEANWHILE, BACK AT THE PLANT...
ANOTHER NO GOODNIK!
WE'VE HAD IT. LET'S GO BACK TO MAKING JAR RUBBERS.
OVER MY DEAD DAGUERREOTYPE.
2

I HEARD YOUR DISTRESS BEEP AND BLASTED RIGHT OVER. PUT DOW CORNING SILICONES TO WORK. YOU'LL HAVE A PERFECT SEAL EVERYTIME.
I'M WITH YOU, 36.
AGENT 36
NIKE KNIGHT
4


THE DIFFERENCE IS DOW CORNING 36 EMULSION! MOLDS RELEASE EASILY... GIVE SHARP SURFACE DETAIL. YOU REDUCE SCRAP, SPEED PRODUCTION, CUT MOLD CLEANING TIME, SAVE MONEY. ALL THAT!
OUR FOUNDER
AGENT 36
BY GEORGE, I THINK WE'VE GOT IT!
YOU'RE A DOLL, 36.
5
MEANWHILE, BACK AT THE LAUNCHING PAD...
STILL SANS SEAL? WE'LL NEVER ORBIT, ALBERT.
VOT A BUST. VOT A VASTE!
LISTEN! THEY'RE PLAYING OUR SONG.
YES, "HOW HIGH THE CHEESE."
6
AND NOW... THE HAPPY ENDING
THERE SHE GOES, AT LAST! THE SEAL WAS PERFECT... WHAT A BLAST!
VOT'S DER SCHIECRET, 36? DON'T LEAF UNS MID-LUFT
CONFIDENTIALLY, DOW CORNING SILICONES. THEY'LL HELP ANYONE WITH MOLD RELEASE PROBLEMS.
THAT SEAL PUTS PI IN THE SKY!
7
GOOD SHOW, 36.
WUNDERBAR.
AGENT 36
YOU CAN RELY ON DOW CORNING SILICONES EVERY TIME. THEY'RE THE GREATEST
8
YOU CAN'T FIND A BETTER RELEASE AGENT THAN 36 EMULSION. GET YOUR FACTS. DOW CORNING'S THE SOURCE. DO IT NOW!
first in silicones
Dow Corning CORPORATION
MIDLAND, MICHIGAN
ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

The Publishers of

RUBBER AGE

extend an invitation

to become

a subscriber to

ADHESIVES AGE

..an urgently-needed

NEW MAGAZINE SERVING THE ADHESIVES INDUSTRY

As readers of *Rubber Age* well know, adhesives are becoming an increasingly important part of manufacturing and distribution industries . . . speeding production, cutting costs, making new and improved products possible—across *all* industry. There are tremendous opportunities for growth, expansion, sales and profits for men and companies prepared to take advantage of them.

Now . . . for the first time—to provide important information on all phases of adhesives—there is a magazine, ADHESIVES AGE, that deals with adhesives exclusively; technology, production, application, sales. Think about it! In as much time as you want to spend with each issue, you will be expertly informed on the developments *you* are most interested in.

A Subscription will bring you 12 issues for only $5.00. Just mail the coupon below.

ADHESIVES AGE • 101 West 31st Street • N. Y. 1, N. Y.

Yes! I want to be a Subscriber to ADHESIVES AGE. Bill me $5 for the year (12 issues) starting with the next issue.
Note: Add 50c for Canadian subscriptions; $1.00 for foreign.

Name ..... Title .....

Street ..... ☐ Home ☐ Business

City ..... Zone.... State.....

Company .....

Products Made .....

1258

Overseas

Southampton—A general purpose synthetic rubber plant, owned by International Synthetic Rubber Co., Ltd., has begun commercial operations and is reported to have an annual capacity of over 70,000 long tons of styrene-butadiene synthetic rubber. The plant sets up a domestic source of general purpose styrene-butadiene rubber supply for England.

France—Societe des Talons Wood-Milns has been granted exclusive rights by Ripple Sole Corp., Detroit, Mich., to manufacture ripple soles in France, for distribution in that country, Algeria and Tunisia.

Casablanca—General Tire Co. has concluded an agreement to invest the equivalent of $6,000,000 in a tire plant to be built in Casablanca, Morocco. Production is scheduled for 1960 and the plant will have an estimated capacity of 125,000 tires a year.

Tehran—A tire and tube plant is under construction by International B. F. Goodrich Co. in Tehran, Iran, and is expected to be completed by July, 1960.

Toluca—Gates Rubber Co., Denver, Colo., plans to build a $500,000 plant to make a variety of rubber products, including a line of V-belts, for the automotive and industrial markets in Mexico.

Rotterdam—The Ketjen Sulphuric Acid Works of Amsterdam, Netherlands, will build a $3.4 million carbon black plant in the Netherlands under a licensing agreement with Godfrey L. Cabot, Boston, Mass.

Belgium—The Ajax Rubber Co. of Belgium was granted exclusive rights to make ripple soles in Belgium by Ripple Sole Corp., Detroit, Mich. Ajax will handle distribution in Belgium as well as in Holland and Luxembourg.

Colombo—Ceylon and China have begun preliminary negotiations to fix the quantities of rubber and rice commodities to be exchanged in 1959, the second year of the current five year Ceylon-China barter. In 1958, China contracted to supply 200,000 tons of rice for 30,000 tons of rubber from Ceylon. The countries plan to discuss how to make a more balanced trade between them so as to eliminate or minimize the necessity of settlement in sterling of outstanding balances. The present figures leave a large balance in favor of Ceylon.

SEASON'S GREETINGS TO EVERYONE EVERYWHERE

GODFREY L. CABOT, INC.

We took a sage suggestion from Santa

"This Christmas check is wonderful," our office Santa Claus told us last year while he was making up for the office party. "But you should have enclosed an application card for more U.S. Savings Bonds on our Payroll Savings Plan. The time to persuade me to *invest* money is when I *have* money."

That was such a sound idea that this year all our Christmas checks to employees will be accompanied by a Payroll Savings card and the suggestion that the recipient sign up immediately for the regular purchase of U.S. Savings Bonds through the coming year.

Experience shows that whenever a company makes it easy for employees to set up sound savings plans, people welcome this opportunity. Today there are more payroll savers than ever before in peace time. For helpful suggestions and the newest information folders and leaflets, call your State Savings Bonds Director. You'll find him listed in the phone book. Or write: Savings Bonds Division, U.S. Treasury Dept., Washington, D. C.

RUBBER AGE

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE

Newest Release from Polymel

C5

for greater economy

A free flowing modified coumarone indene resin

. . . we suggest for economic reasons that you try Polymel C5 coumarone indene resin. This material has proven itself in laboratory and major production.

14 ¾c a lb. L.C.L.

14½c a lb. truckload or carload

PROCESSING COSTS GO DOWN...

with Polymel's new C5

- Polymel's C-5 is a great plasticizer!
- An excellent dispersing agent!
- C-5 for outstanding extrusion!
- C-5 for exceptionally clean and clear mold!
- C-5 helps abrasion resistance!
- C-5 aids flex resistance!
- For all types of natural rubber & GR-S compounds.
- C-5 is a free flowing powder!
- Has outstanding aging characteristics!

in any quantity. Write for FREE sample.

Shipments through our EXPORT DIVISION.

of Compounding ingredients for Reinforcing, Plasticizing, Extending and Processing Natural and Synthetic Elastomers AND RELATED PRODUCTS.

All Prices FOB Baltimore, Md.

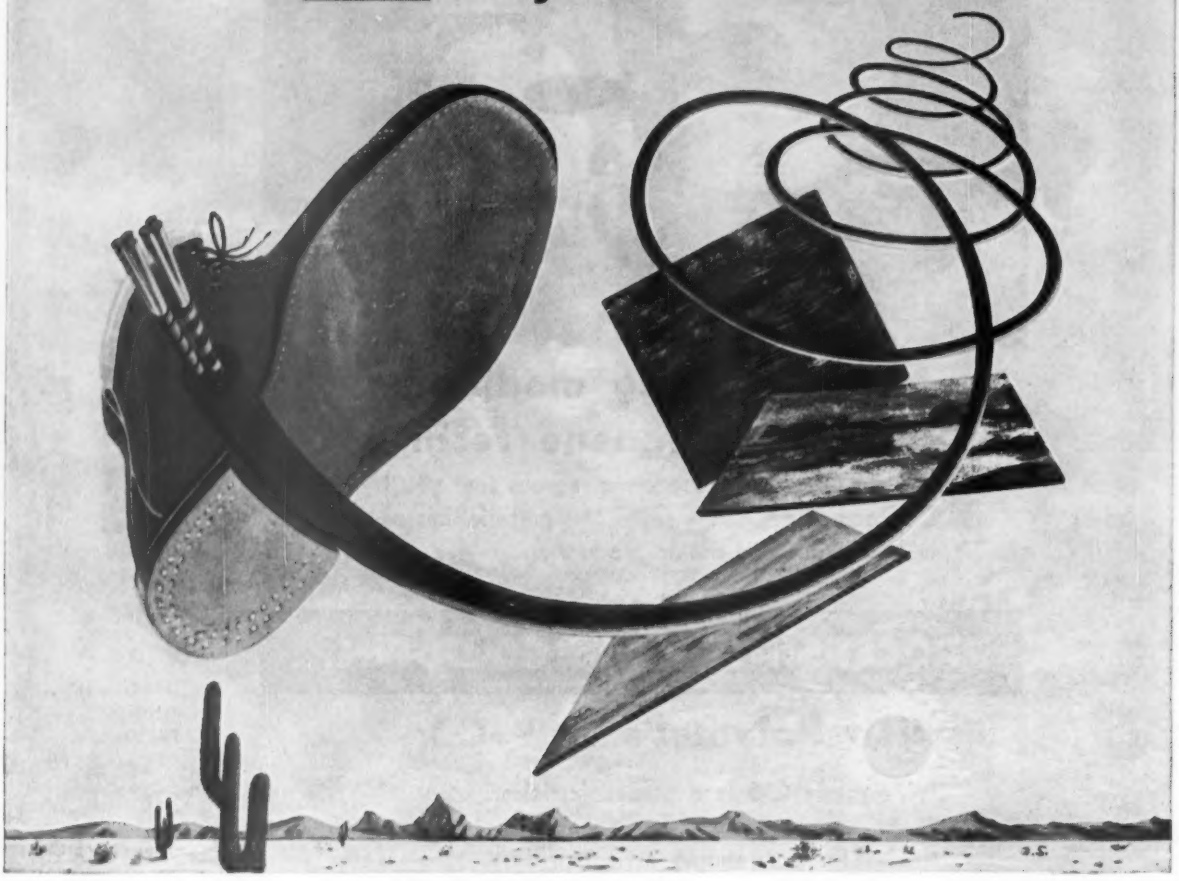
THE Polymel CORPORATION

POLYMEL BUILDING
Eastern Ave. & Patterson Park Aves.
Baltimore 31, Md.
EAstern 7-1335

NAUGAPOL K-50

SPECIALLY-PROCESSED SBR POLYMER

...a new dry rubber blend



Now a new dry rubber blend has been added to the Naugatuck line to give you a still wider choice of "wire grade" rubbers to meet your product needs.

A special masterbatch of high styrene resin and low-temperature polymerized synthetic rubber, Naugapol® K-50 offers unusually good processing characteristics together with the "dryness" and high-cured physicals for which all Naugapols are noted.

Primarily designed for use with additional butadiene-styrene copolymer—for such products as shoe soles, floor tile, and wire insulation—Naugapol K-50 is the only blend of this kind available which is suitable for wire insulation.

Try Naugapol K-50—available in pellet form—wherever you require high dielectrics, low-ash, easy processing. For detailed information on Naugapol K-50, the Naugapols generally, or still other special grades of synthetic rubber, write us today.

Naugatuck Chemical

Division of United States Rubber Company

1222N Elm Street
Naugatuck, Connecticut

US RUBBER

Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices • CANADA: Naugatuck Chemicals Division, Dominion Rubber Co., Ltd., Elmira, Ontario • CABLE: Rubexport, N.Y.

RUBBER AGE/Vol. 84, No. 3/December, 1958

The Colloid Phase Carbon Reinforcement of Rubber

By recognizing the time factor in colloidal reactions, a significant improvement in carbon reinforcement of rubber has been effected

By H. A. BRAENDLE, G.L. HELLER* and J. W. WHITE*

Columbian Carbon Co., New York, N. Y.

By recognizing the time factor in colloidal reactions, a significant improvement in the carbon reinforcement of rubber has been effected. Tread wear improvements of 15% over dry mixing have been confirmed. Further study on the process has revealed unexpected processing advantages. The range of processable carbons has been extended to full SAF. An attempt will be made to rationalize some of these new effects.

THE COLUMBIAN system of masterbatching takes advantage of the time rate of reaction between colloidal systems. It makes full use of the natural affinity of carbon black for organic rubbers. It effectively separates the mixing and bonding stages of carbon black-rubber masterbatching.

In 1940 Bostrom, Lange, et al *(1)*, in comparing carbon black as a reinforcing agent for styrene rubber with other fillers, spoke of a "special buna-carbon black effect."

In 1943 Columbian Carbon Co. *(2)*, in studying the effect of various carbons on styrene rubber, found that "carbon reinforcement is an integral component of Buna S (styrene rubber) vulcanization" and that "a minimum of 350 to 400 acres of carbon per 100 pounds of Buna S (styrene rubber) is required to assure that snappy cures are not obtained at the cost of falling tensile." Columbian's studies on the carbon gel complex *(3, 4)* likewise show a chemical factor in the rubber-carbon bond.

Conventional vulcanizing agents are mixed into rubber at lower than reaction temperatures, dissolve in the rubber and diffuse so that vulcanization is uniform throughout a piece of cured rubber, at least to the extent that heat input has been uniform. Carbon black, of course, is insoluble, and in dry mixing even on a relatively cool mill, mixing and reaction with the polymer go on simultaneously.

By separating these two steps, as the Columbian process does, the carbon black can be mixed into the rubber at below-reaction temperatures, and to a uniformity limited only by its insolubility in rubber. By hindsight then, this separation of the mixing and bonding steps together with the superior degree of dispersion account for the interesting and unexpected properties developed in compounds made with Columbian-type black rubber.

A New Concept in Making Masterbatches

On May 15, 1957 *(5)*, Columbian Carbon Co. announced a new process of making masterbatches of rubber (specifically, styrene rubber), carbon black and oil. The idea itself was by no means novel, but Columbian introduced a new concept, namely, the time rate of reaction between colloids. A slurry of carbon black in water alone is prepared by hydraulic

* Columbian Carbon Co., Monroe, Louisiana.

Note: This paper was presented before the Deutsche Kautschuk-Gesellschaft, Cologne, Germany, May 7-10, 1958. It was published in German in "Kautschuk und Gummi," September, 1958.

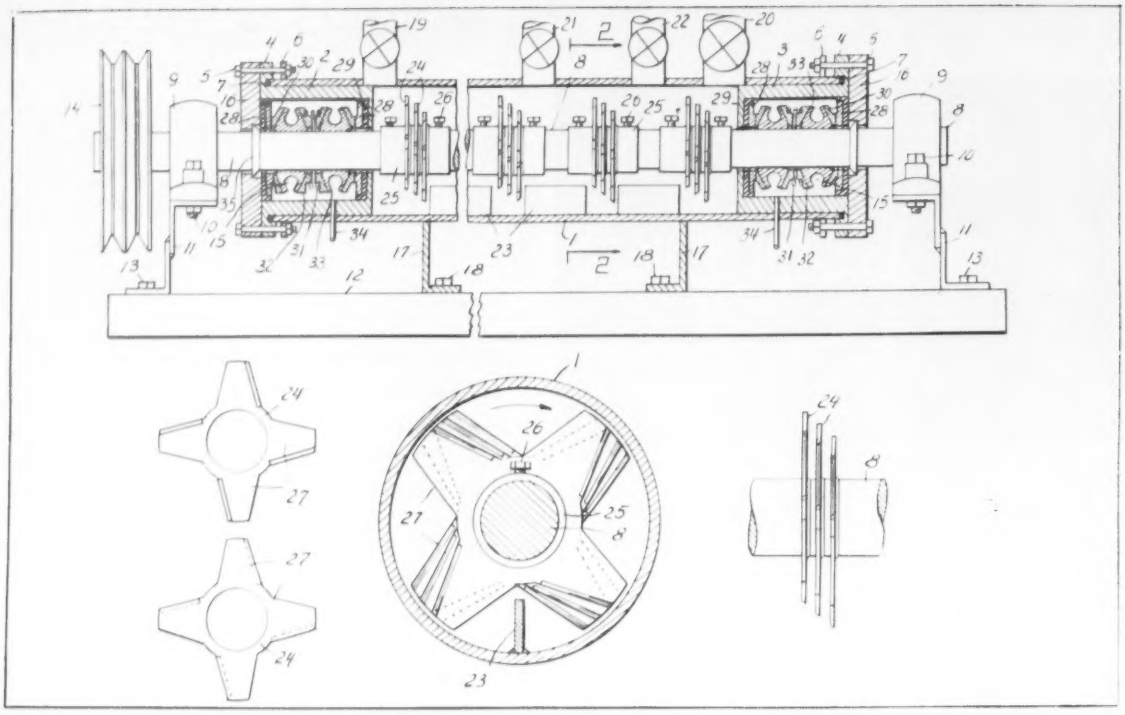


FIG. 1—Schematic diagram of a carbon black dispersing machine, and of some of the component parts.

shock and shear of a higher order than has been hitherto considered. All grinding of the black in the water is eliminated, reducing damage to the black itself and eliminating the practical difficulties always involved in such grinding operations. At the same time, this gives a very uniform distribution of the black throughout the masterbatch without doing any damage to the rubber phase. Stated otherwise, carbon black and rubber are allowed to exert their natural affinity for each other without interference from added materials at a stage in the process where both are colloidally dispersed and where advantage can be taken of the high rate of reaction resulting from their substantially instantaneous intermixture.

This interaction is a function of available surface and the Columbian method takes full advantage of the tremendous surface developed by both carbon black and rubber, while the latter is still in the latex phase. By eliminating extraneous dispersing and stabilizing agents, the quality of the rubber-carbon bond is improved, and by taking advantage of the high surface developed by carbon black in an aqueous slurry and by rubber in latex, a much more effective use of the surface of both colloids is made than has hitherto been possible. The present discussion covers some of the mechanical details by which this is accomplished and, more importantly, some of its consequences.

FIG. 2—Carbon black dispersing machine.

In its simplest terms, the Columbian process involves stirring carbon black in water alone under conditions of high velocity, high hydraulic shock and shear, in order to break up the beaded black and the agglomerates within the beads to a reasonable approximation to particulate dispersion. It is well known that without the help of dispersing agents, peptizing agents, protective colloids, or what have you, carbon black will not stay suspended in water, but will settle out. The Columbian process recognizes this fact and therefore keeps the black in suspension by continuing violent agitation and by blending a stream or streams of the carbon black slurry with a stream of latex. This happens under conditions of comparable velocity and shear so as to attain substantially instantaneous and uniform intermixing of the two colloids. The carbon black slurry has no protective colloid of its own, nor any dispersing agent. The carbon black itself is therefore free to attach itself immediately to the rubber latex particles.

The result is the equivalent of conventional salt creaming, namely, the beginning of coagulation on the

FIG. 3—Carbon black dispersing machine disassembled to show the rotor.

microscale. The blend of the streams is immediately dropped into an acid bath to finish coagulation in the conventional manner. The crumb so produced is porous, relatively non-tacky, and suitable for efficient washing and drying. It is generally recommended for a standard styrene rubber (hot or cold), that the major part of the final processing oil be added at the same time the latex and black slurry streams intermingle. With latex of high molecular weight used for oil extended rubber, the extending oil is added either with or without prior emulsification at this same stage.

Figure 1 is a diagrammatic drawing of a machine found particularly effective for preparing the carbon black slurry. It has no tight clearances and therefore produces no grinding action. The rotor with its blades revolves at 3500 to 6000 rpm, producing high velocity and shear, and the stators on the barrel of the machine introduce the hydraulic shock. At the same time, they prevent the entire charge from passing through the machine in a solid core that would prevent maximum effectiveness of high hydraulic shock and shear.

Figure 2 is a photograph of one of these machines.

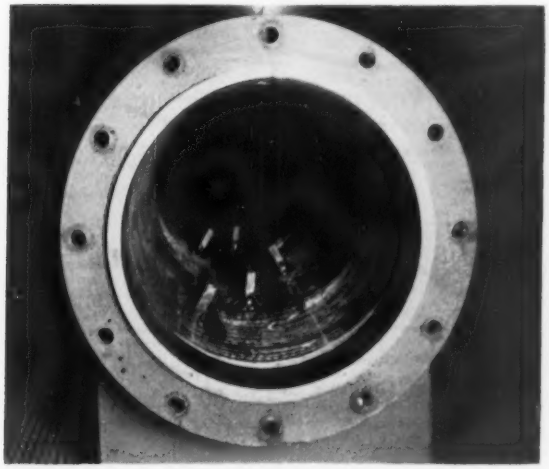


FIG. 4—Inside of barrel of the carbon black dispersing machine with stators in place.

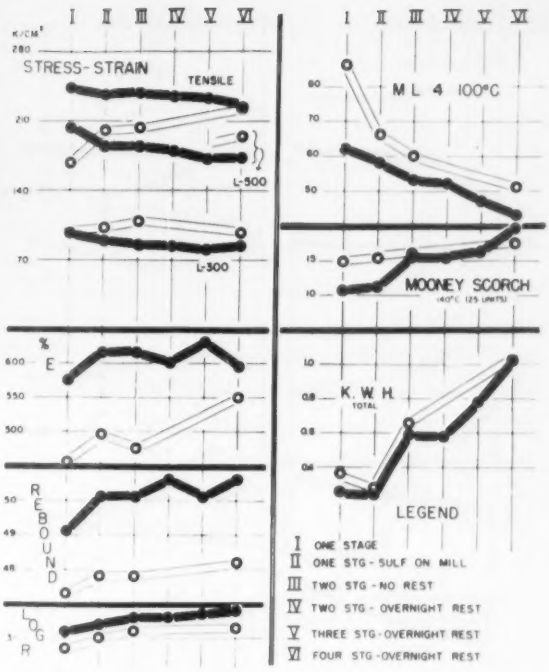


FIG. 5—Mixing efficiency study of styrene rubber (OEP 37.5). (Note: unless otherwise indicated, in all figures solid line = Columbian black rubber masterbatch stocks, hollow line = dry mixed controls).

It is about one meter long by about fifteen centimeters in diameter and is made of stainless steel throughout to eliminate corrosion problems. A number of its unique features that need not be detailed here result in an effectiveness not attained by earlier machines of similar type and not to be expected from its extreme simplicity. Naturally this is not the only way to prepare a satisfactory dispersion of black in water alone, but it is a very economical and effective means. Figure 3 shows the rotor of this machine with its sequence of blades, in this particular case set up in groups of three with gaps for the stators. Figure 4 shows the inside of the barrel of this machine with the stators in place.

Pilot Operation to Commercialization

In pilot operation, carbon black-synthetic rubber masterbatches—black rubber for short—have been made for most of the major synthetic rubber manufacturers in the United States. Their own latex was used and the compositions of the final masterbatches were adjusted to their own ideas of final composition. Many repeats were run and tests were carried out by the different companies in their own or affiliated plants, and also by Columbian in a number of tire plants. An improvement was shown in tread wear, particularly for ISAF blacks, of the order of 15% over Banbury mixing. The seven largest rubber manufacturers in the United States have already adopted the process and are in various stages of its installa-

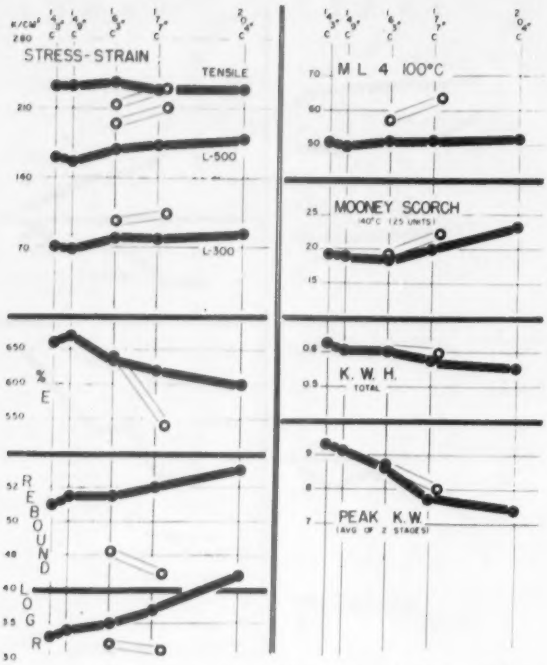


FIG. 6—Banbury dump temperature study of styrene rubber (OEP 37.5).

tion and commercialization. Tests soon developed that the advantages of the Columbian process were also realized with the finer blacks with their greater reinforcing potential.

Processing Studies

One of the interesting properties developed by the Columbian process is the lower Mooney viscosity of the masterbatch and the treads made from it. This prompted a study on processability of tread stocks made from Columbian black masterbatch as compared with dry mix counterparts.

Laboratory Banbury mixes were prepared, duplicating as nearly as possible the times and temperatures used in factory process, to give series of stocks ranging from the shortest possible to definitely overprocessed. Figure 5 shows six such mixings. In Example 1, the entire compound was prepared in a single stage or pass through the Banbury, the stock being then ready for extrusion or calendering. In the second mix everything was introduced except the sulfur and this was added on the sheet-off mill. The third was likewise a two-stage mix, but the sulfur was added in a slow-speed Banbury operation with no rest period between the Banbury runs.

The fourth mix was like the third, except that the stock rested overnight before being put back into the Banbury for the addition of the sulfur. The fifth mix, a so-called three-stage mix, introduced an extra remill of the stock without sulfur, again in the slow-speed Banbury. Sulfur was added in the third stage in the Banbury. In both cases overnight rests came between Banbury runs. The sixth mix had one more remill in the Banbury with an extra overnight rest. The Columbian masterbatch stocks are shown in solid lines and the dry mixed controls in hollow lines.

In all cases tensile strength of the black rubber mix was better than any of the dry mixed stocks with the possible exception of the overmilled stock of mix number six. Of particular interest is the very striking tensile advantage of the one-stage mix with the Columbian black rubber. This is particularly significant because of the trend toward high-pressure, high-speed Banbury mixing of tread stocks, as a time- and cost-saver. Modulus values all lie lower than the dry mixed counterparts. Elongations are strikingly better for the Columbian black rubber. Rebounds, likewise, are better for the Columbian black rubber than for the dry mixed stocks. Electrical resistivity, shown as the logarithm (log R), is also slightly higher.

Particularly interesting is the flatness of the tensile, modulus and elongation curves; that is to say, they are very little affected by the amount of processing, eliminating much of the variability in quality of the finished product caused by under- or over-processing. The Mooney viscosity for the Columbian black rubber stocks is lower than for their dry mixed counterparts. This is particularly true with minimum processing.

The Mooney scorch represents an anomaly; in spite of a lower Mooney viscosity, the time to scorch is shorter. This arises from the fact that, by and large, Columbian black master tends to cure faster than dry mix. However, the difference is so slight that minimal adjustment of curative can easily take care of it.

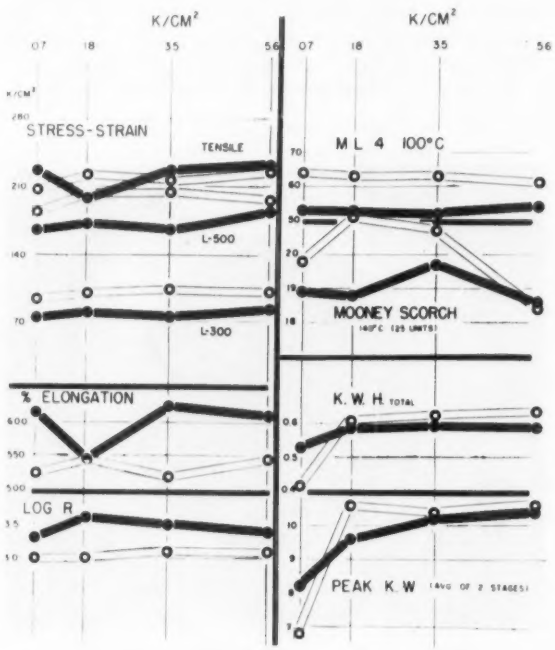


FIG. 7—Banbury ram pressure study of styrene rubber (OEP 37.5).

Total power consumption goes along with Mooney viscosity and is somewhat lower.

With the discovery and development of the carbon gel concept, it was found necessary to set up minimum, as well as maximum, Banbury dump temperatures in order to reduce day to day variations in modulus of the finished tread, and thereby fluctuations in tread life. In some, the time of mixing was determined by the temperature attained in the Banbury. It was therefore decided to compare Columbian black rubber to dry mix through a range of Banbury dump temperatures from 143 to 204°C. The first one is much cooler than would be feasible in a factory Banbury and the high one is well above the limits that indicate the onset of tread cracking problems.

In Figure 6 the results of this study show enhanced tensile, lower modulus both at 300% and 500% elongations, and better elongations at break for the black rubber. Of particular significance again is the flatness of these three curves and the relative insensitivity of Columbian black rubber tread stocks to this processing variable.

Rebound again shows improvement, and here, as in the previous study, the good hysteresis properties shown by rebound are confirmed by lower build-up of temperature in other accepted dynamic hysteresis tests. Log R is slightly higher at the lower and intermediate temperatures, and significantly higher at the extreme of temperature where tread cracking would occur. Mooney viscosity again is lower, and the time to scorch is slightly lower again, reflecting the slightly faster cure of Columbian black rubber treads. Power

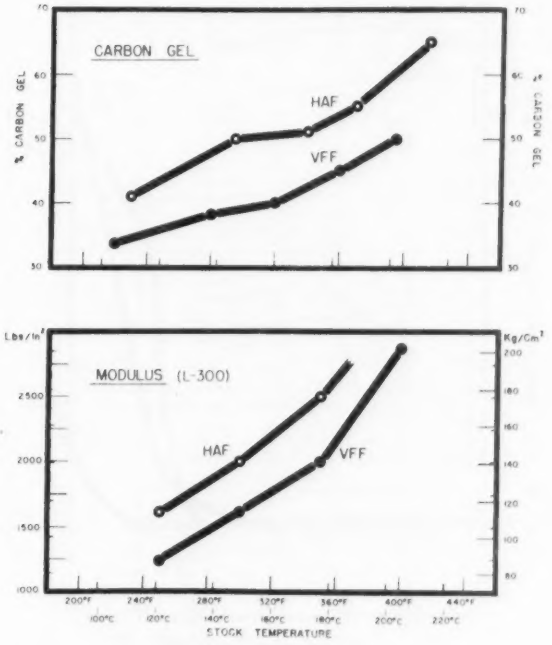


FIG. 8—Gel and modulus versus stock temperature (based on Sweitzer et al).

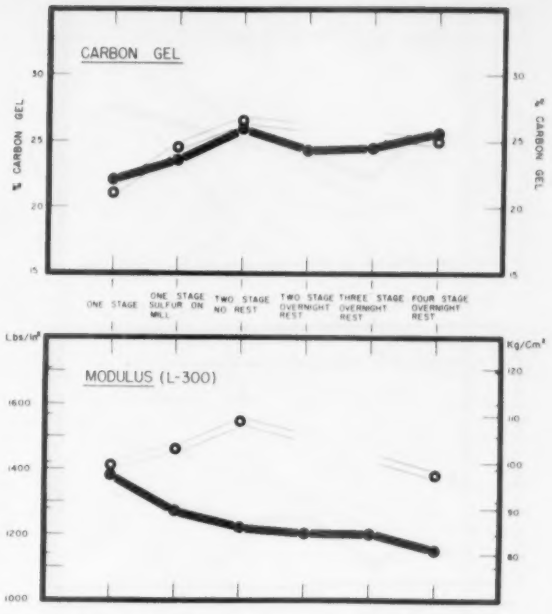


FIG. 9—Gel and modulus versus mixing efficiency.

consumption, both total and peak, is again favorable to the Columbian black rubber.

Prompted by the trend towards high pressure Banburys, a series of mixes was made in which Banbury ram pressure was varied. Figure 7 shows again a series that ran from lower than normal to an upper value allowing no floating of the ram at all, even though the chamber was well filled to conform with good factory practice. The observations from this study are the same as those from the two previous ones.

From a processing point of view, therefore, Columbian black rubber seems to have distinct advantages over dry mixing, as shown by the following:

Cured Physicals

Tensile	Higher
Elongation	Greater
Modulus	Lower
Rebound	Higher

Processing

Power	Lower
Mixing time	Shorter
Mooney viscosity	Lower
Cure	Slightly faster
Mooney scorch	See cure and ML-4
Peak power	Equal to dry mix; much lower than present blackmaster

Sensitivity to Processing Variables

Time	Less
Temperature	Less
Banbury pressure	Less

To the factory superintendent, this means a narrower range of quality variation due to processing.

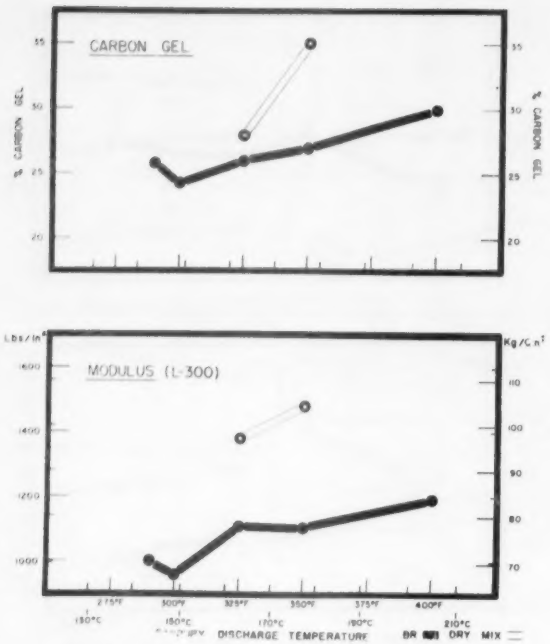


FIG. 10—Gel and modulus versus dump temperature.

Carbon Gel in Black Rubber

Columbian's early work on carbon gel *(4)* referred to above showed that both gel and modulus increase significantly with mixing temperature and to a somewhat lesser degree with mixing time. Figure 8 is a composite of Figures 10 and 15 of that paper. The relative insensitivity of physical properties of Columbian black rubber treads calls for a look at the carbon gel picture.

Figure 9 shows the gel and modulus trends for the mixing efficiency series shown in Figure 5. The carbon gel values are within experimental error of each other for the successive degrees of mixing. The modulus of the dry mix follows the pattern of Figure 8 up to the third mixing procedure. A four-stage mix (VI) shows a drop in modulus due to over-processing at relatively cool temperatures. The black rubber treads show a drop in going from Mix I to Mix III, then remain constant to the last procedure (VI) when a slight drop occurs again. In short, the old correlation between gel and modulus seems to have fallen down.

Figure 10 shows the trends of gel and modulus to correspond to the Banbury dump temperature study of Figure 6. In both cases (black rubber and dry mix) modulus and gel move in the same sense except that the rises for dry mix are much steeper than for the black rubber stocks.

The exact reason for these differences is as yet not fully understood. We can, however, make a guess. Going back again to the work of Sweitzer et al *(4)* we reproduce their Figure 2 as our Figure 11. Here we see that up to a temperature of c. 300°F. (150°C.) oven heating does not produce any cross-linking and insolubilitization of styrene rubber in contrast to the immediate development of carbon gel as shown in Figure 8. It is well known that it is impossible to differentiate between polymer bound to carbon black and cross-linked polymer entangled with it. This dilemma was responsible for the name "carbon black gel complex" or, more simply, "carbon gel."

Referring again to Figure 10, it is posible that the sharper rise in modulus of the dry mix stems from added stiffness of cross-linked polymer formed simultaneously with the dispersion phase of Banbury mixing. Highly cross-linked styrene rubber is known to be stiff and short. It may well be then that where mixing and bonding are separate steps, as in the use of Columbian-type black rubber, the polymer cross-linking effect is lessened. In dry mixing a great deal of inhomogeneity of black concentration must occur and a momentary very high temperature be reached as the mix moves under the rotor blades. The Banbury temperature chart fails to show this since it measures only the mean temperature. This supposed reduction in cross-linked polymer would then also explain the better elongations of the black rubber tread stocks.

Carbon Fineness and Loading

As in any dynamic industry, so in this—the quest continues for more and more effective reinforcing carbon blacks. Because of the recognized role of fineness, this search has been largely directed toward finer particle carbons. In most places HAF carbon is still the preferred grade. ISAF carbons, too, are

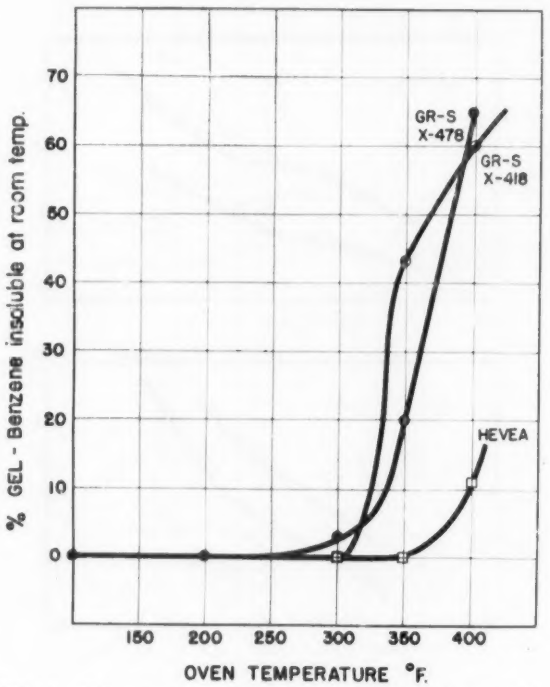


FIG. 11—Gel versus oven heating (one hour) for Hevea and styrene polymers (from Sweitzer et al).

receiving considerable acceptance, at least in some tire plants. Some plants have actually gone back to HAF because of unsatisfactory performance of ISAF treads. To the best of our knowledge, this stems mainly from the difficulty of adequately dispersing the finer carbon economically.

Where good dispersions of ISAF have been attained, this finer carbon has shown improved quality. But across the whole industry, ISAF carbon is still recognized as definitely on the fine side for good processing and thus for good quality in the finished tread. By the same token, the full SAF blacks are used only in special stocks made to unusually rigid quality specifications. We therefore investigated the effect of fineness in the Columbian black rubber process. Black rubber was prepared using HAF, ISAF and SAF carbons, respectively. None of these gave any trouble in the Columbian black rubber process.

A series of loadings was prepared for each of the carbons. Dry-mixed-equivalent tread type compounds were prepared to match the stocks made for the black rubbers. Carbon surface addition to styrene rubber, whether via loading or fineness, dominates tensile development *(2)* and this property will be used to assess the effects. Figure 12 shows the better tensiles of the black rubber stocks through loadings of c. 35 to c. 55 phr.

It is interesting to note that the improvements are greater at the lower loadings. This is brought out more clearly in Figure 13 where we plot △ Tensile (the improvement in tensile) of black rubber over dry mix as a function of loading. This again shows the greater benefits obtained at the lower loadings and, in addition, that by our black rubber process, the finer carbons approach their potential. It also indicates that black rubber will prove useful in stocks carrying both less carbon and more carbon than treads.

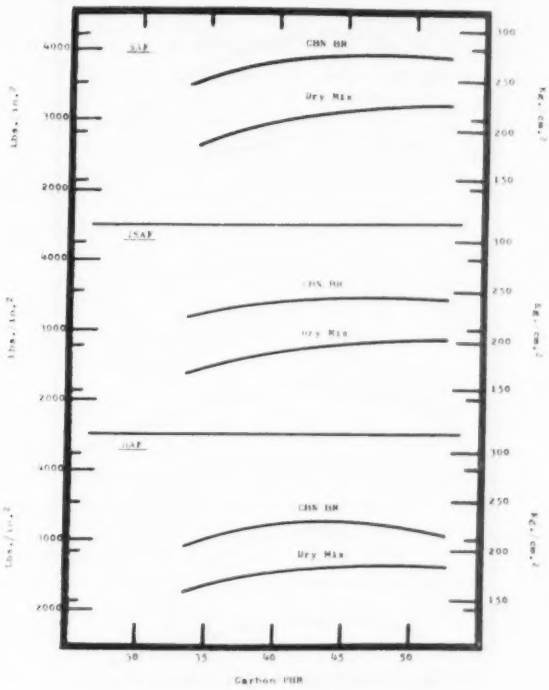


FIG. 12—Tensile versus carbon loading.

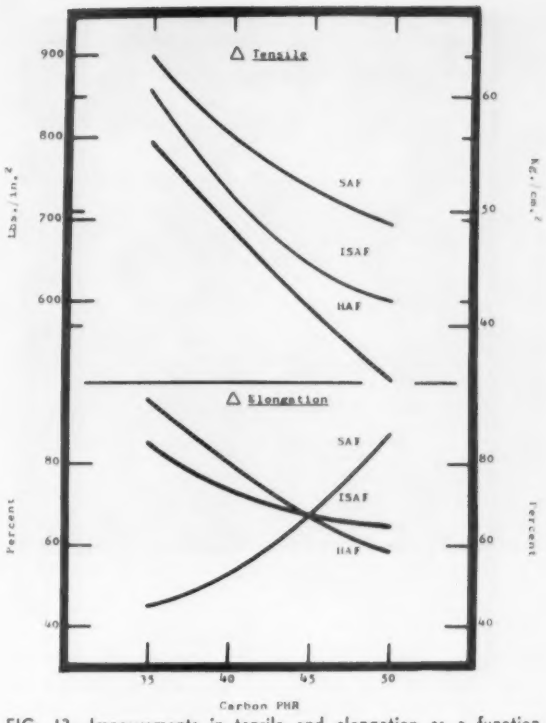


FIG. 13—Improvements in tensile and elongation as a function of carbon black loading.

The △ Elongation curves are also shown in Figure 13. Note particularly the turning point at the 45 phr loading. Since this is an exploratory study only, absolute validity of the phenomenon cannot be claimed. These facts, however, add some weight to the views expressed earlier. The Columbian latex-carbon black masterbatch process separates the dispersion and bonding steps of carbon incorporation. By maintaining particulate dispersion with increasing carbon surface, we move closer to complete homogeneity and greatest uniformity of the carbon-rubber effect. The cross-linked, clear polymer gel will then be in smaller units and better distributed through the carbon gel lattice and its shortening effect on the stock will be lessened.

The electron microscope bears out this concept. Figure 14 is an electron micrograph of a microtomed section of an LTP dry mixed tread in which the Banbury temperature was deliberately run excessively high. Note the large areas of non-pigmented rubber. These, we believe, are responsible for the bad cracking performance of LTP treads that are run too hot. The unpigmented polymer is of course notoriously stiff, short and weak.

Figure 15 is a similar electron micrograph of a black rubber tread given normal (factory) Banbury

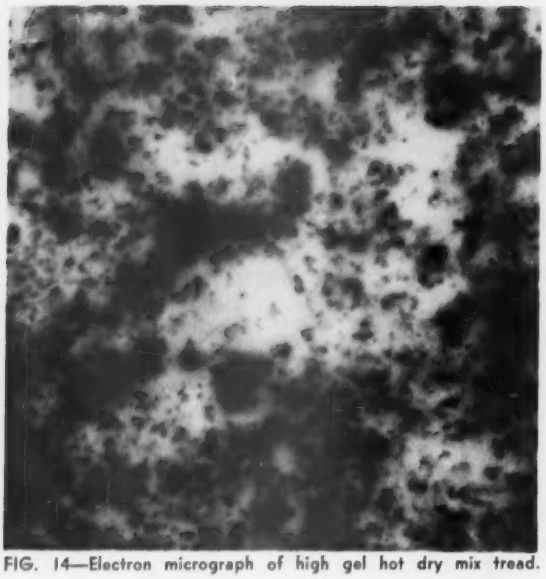


FIG. 14—Electron micrograph of high gel hot dry mix tread.

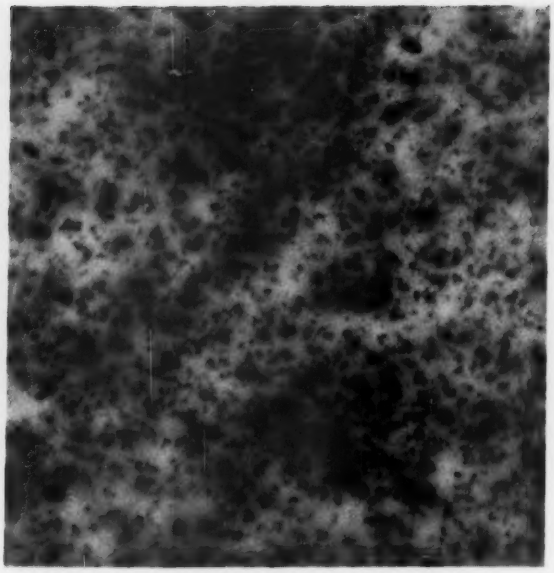


FIG. 15—Electron micrograph of a black rubber tread given normal Banbury treatment.

treatment. Note particularly the greater uniformity of distribution of the carbon gel and the dispersion of the cross-linked polymer in much smaller units throughout the carbon gel.

With any single type of polymer, tensile strength is understandably a factor in tread wear. Similarly, breaking elongation is a factor in cracking resistance of a tread. We therefore submit tensile product as a criterion not wholly unrelated to tire performance. (T.P. = Tensile psi $\times$ % Breaking Elongation $\times$ 10^{-4}.)

Figure 16 shows the effect of the Columbian process and of carbon fineness and loading on tensile product. Based both on the range (loading) and intensity ($\triangle$ T.P.), Columbian-type black rubber would seem on this quality criterion to deserve close and critical examination.

In Figure 17 the tensile products of the three carbons in black rubber are compared. There is a hint here that optimum quality occurs at higher loadings, the finer the blacks used. Should this be confirmed, it will represent a trend exactly the opposite to experience with dry mixing where general recommendations and practice have been to cut black loading with the finer carbons. This situation is admittedly tied in with the added difficulty of incorporating the finer black by dry mixing.

Blending of Black Masterbatches

Some compounders have already expressed interest in applying the Columbian black rubber process to other than tire treads and have expressed the belief that in due course all carbon black will be put into synthetic rubber by the latex process. The logical place to do this is at the polymer plant. This prospect is not without its unpleasant aspects. The polymer manufacturer may be called on to prepare black rubber with three or four grades of carbon black at several concentrations of each. Likewise, the purchaser of black rubber is concerned over expansion of inventories. In addition, the tire compounders rarely agree completely on the optimum black concentration for

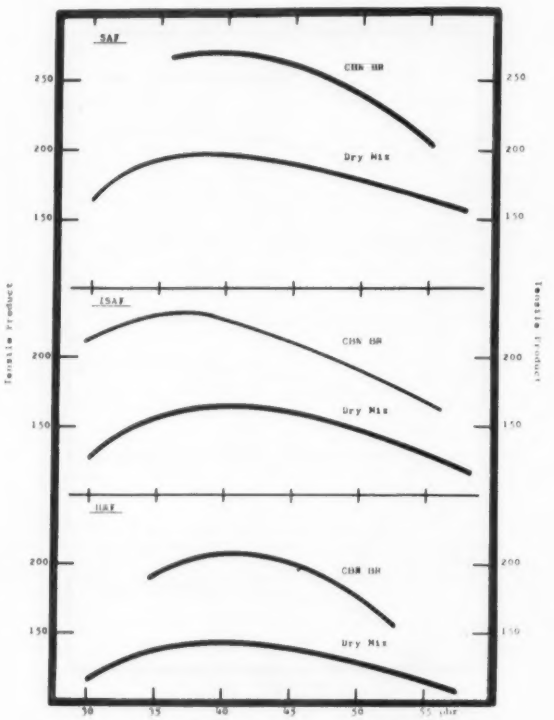


FIG. 16—Effect of carbon fineness on tensile product.

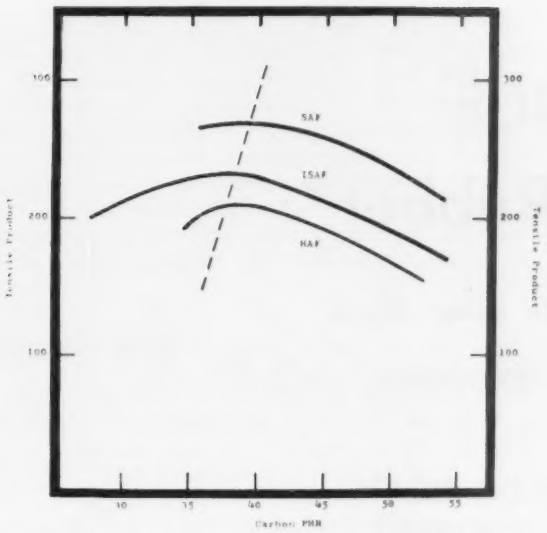


FIG. 17—Effect of carbon black on tensile product in black rubber.

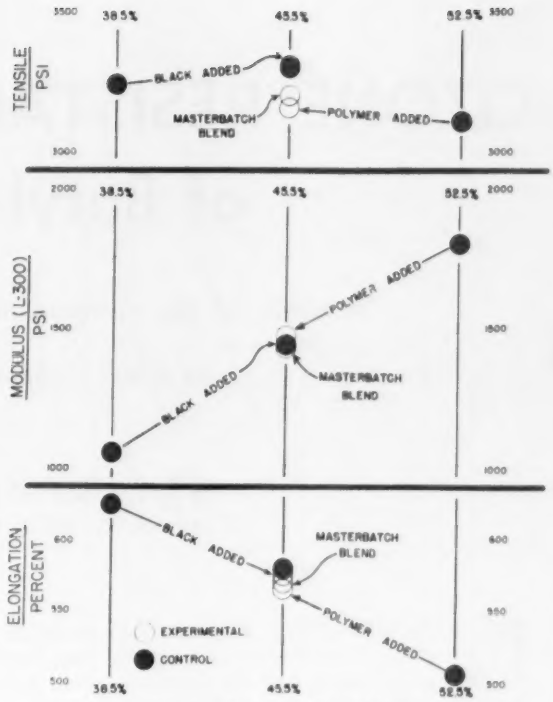


FIG. 18—Compounding flexibility of black rubber.

any particular use, to say nothing of the limitations and requirements for specific products.

Looking forward to this dilemma, we undertook the following study of blending masterbatches of high and low loadings to match a master of intermediate loading. This intermediate loading was also duplicated by adding black to the lower black master and by adding clear polymer to the high-loaded master. The results are shown in Figure 18.

By all three methods the results lie so close together, actually within experimental error, that a very open scale had to be used to separate them on the chart. Bearing in mind that this blending study, like the other work reported here, was exploratory only, it appears that the number of masterbatches necessary to cover most compounding requirements need not be unduly burdensome to either the polymer maker or the consumer. The addition of carbon to bring the black loading up to requirements may even give better results than adding clear polymer to a master with too much black. But again it must be pointed out that all three methods (adding black, adding polymer and blending masterbatches) seem to give physical properties within experimental error of a tailor-made masterbatch.

Conclusions

The Columbian black rubber system, in addition to giving tire treads of better wearing quality than dry mixing, has other unexpected advantages:

(1) It offers less sensitivity to factory processing variables, both time and temperature.

(2) Banbury batches prepared with minimum ram pressure suggest good results even if all factory processing is done on open mills.

(3) By separating the mixing and bonding phases of black incorporation into rubber (at least for styrene rubber synthetics), the otherwise deleterious effects of cross-linked, unpigmented polymer are minimized.

(4) The finer, more reinforcing carbons can be used as readily as HAF carbon. The tire manufacturer now has in sight means to keep pace with the demand of the automobile manufacturers and the driving public for better tires.

(5) By blending masterbatches of high and low black concentration the number needed to cover the gamut of commercial rubber is reduced to reasonable proportions.

(6) By eliminating dispersing agents, the carbon-rubber affinity or bond is developed to the full.

(7) By accomplishing an otherwise unattainable dispersion of the carbon in the rubber, a more uniform and advantageous distribution of the carbon gel throughout the cured rubber is possible.

(8) The Columbian process has thus significantly extended the usefulness of carbon black in rubber since neither the black nor the rubber is subjected to the damage of severe high viscosity milling.

LITERATURE REFERENCES

(1) Bostrom, S., Lange, K., Schmidt, H., and Stocklin, P., *Kautschuk und Verwandte Stoffe*, pp. 423-50 (1940).
(2) "Carbon Reinforcement of Buna S (GR-S)", *Columbian Colloidal Carbons*, Vol. 4 (January, 1943).
(3) Braendle, H. A., Sweitzer, C. W., and Steffen, H. C., "Application of Very Fine Furnace Black in Low Temperature GR-S," *Rubber Age*, Vol. 64, p. 708 (1949).
(4) Sweitzer, C. W., Goodrich, W. C., and Burgess, K. A., "The Carbon Black Gel Complex in Cold Rubber Reinforcement," *Rubber Age*, Vol. 65, p. 651 (1949).
(5) Braendle, H. A., "Improving the Carbon-Rubber Bond," *Rubber World*, Vol. 136, p. 835 (1957).

OZONE RESISTANCE of Butyl Rubber

A study of the mechanism of ozone attack on butyl rubber vulcanizates

By R. F. GROSSMAN and A. C. BLUESTEIN

Anaconda Wire & Cable Co., Marion, Indiana

THE CONTRIBUTION of ozone attack to the deterioration of rubber of all types has long been recognized *(1,2)*, and the factors involved have been the subject of numerous investigations *(1)*. Although a considerable amount of this work has dealt with the influence of two of the most significant variables, ozone concentration and applied stress, quantitative or semi-quantitative treatments have been singularly lacking. It is the purpose of the present and of future investigations to re-evaluate these variables in an attempt to elucidate the mechanism of ozone attack. It is believed that such insight would be valuable *per se*, and should be useful in the development of ozone-resistant rubber compounds.

The superior ozone resistance of butyl rubber makes it an excellent subject for study. The recent work of Dunkel and Phelan *(3)* points out the difficulty in abstracting conclusions from data obtained from ozone testing of the less resistant vulcanizates; in the cases of styrene rubber and natural rubber, the ozonization process is completed so rapidly that the effects of ozone concentration and applied stress are masked.

Experimental Procedure

Test Compound: A typical butyl rubber wire insulation stock, based upon Enjay Butyl 035, was employed throughout.

Test Conditions: Samples were press cured to optimum physical properties and 1 x ¼-inch dumbbells prepared according to ASTM Standard D-412 *(4)*. A relaxation time of one hour, using a calcium chloride desiccator to remove surface moisture, was employed. Four to six samples were used in each test. The time required for the first visible crack to appear in half the samples was reported as the ozone failure time. It is believed that, when only a few samples are tested, this method is sounder than the extraction of an arithmetical average, as it is less apt to be affected by a single defective specimen. When closely similar samples are tested, the ozone failure time can be taken as representative of a given point towards completion of the reaction between compound and ozone.

Ozone testing was carried out in a test chamber constructed in accordance with ASTM recommendations *(5)*. Ozone was produced by the silent discharge method, employing a water-cooled, constant temperature high voltage electrode, and delivered, at a measured flow rate, into a transparent ozone chamber. It has been shown *(6)* that a cooled, constant temperature electrode is necessary for the production of a constant output of ozone in the silent discharge process.

Air, rather than oxygen, was used as the ozone source. It was to be expected, therefore, that the ozone produced would contain traces of nitrogen pentoxide, which has been shown to form during silent discharge in air *(7)*. As nitrogen pentoxide is a relatively powerful oxidizing agent, it was felt that its presence might accelerate ozone aging, perhaps even catalytically. To investigate this point, partial pressures of nitrogen pentoxide as high as 50 mm. mercury were introduced into the ozone chamber, from a nitric acid source, during ozonization. This was found to shorten ozone failure time to the extent of 2 to 5%. It was concluded that nitrogen pentoxide does not catalyze the ozonization process, and in the concentrations likely to be found in actual practice, 2 to 3% of the ozone concentration *(8)*, is harmless.

Ozone concentrations were determined by absorption of an air sample in a solution of neutral buffered sodium thiosulfate, containing a small amount of potassium iodide. The consumption of thiosulfate, through iodine-catalyzed oxidation by ozone, was determined by electrometric titration with iodine. It is felt that this method is superior in accuracy and precision to that recommended by ASTM specifications

(5)—absorption of ozone in a potassium iodide solution, and thiosulfate titration of the liberated iodine.

Concentrations of ozone in the range of .01 to .50 volume per cent were employed, in order to minimize the effects of variables due to experimental conditions, e.g., ambient relative humidity, which may become significant at very low ozone concentrations. A standard location within the test chamber was used in positioning samples, to avoid errors resulting from concentration gradients. All tests were conducted at 25 ± 2°C.

Discussion of Results

Effects of Elongation: The effect of applied stress upon ozone resistance was investigated employing a linearly applied extension. Dunkel and Phelan have shown *(3)* that the ozone resistance of Enjay Butyl 035 is highly dependent upon elongation. Ozone failure time versus per cent elongation, in the case at hand, is plotted in Figure 1. It can be seen that at elongations below 200%, failure time is a rapidly changing function of elongation, while at higher elongations, ozone failure time loses its elongation dependence. The following interpretation is suggested.

At low elongations, the more or less random orientation of the polymer chains permits a reordering process when a chain is broken, e.g., by ozonolysis, relieving strain. Hence, when the surface of a specimen is attacked by ozone, each chain scission causes a strain-relieving readjustment, until enough chains are broken to crack the surface under the applied stress. At elongations of 100 to 200%, the polymer chains are forced into an ordered pattern. This is shown by the emergence of a regular, if not crystalline, diffraction pattern at that point. Hence, at elongations greater than 100 to 200%, the polymer is no longer able to accommodate chain scission by readjustment, and ozone failure time becomes independent of elongation.

Compounds with relatively poor ozone resistance, such as those based upon styrene rubber and natural rubber, may be expected to show only a minor dependence upon elongation, since in these cases, ozone cracking proceeds so rapidly as to completely obviate any advantage obtained through relaxation. In connection with ozone resistance and elongation in general, a recent article *(3)* comments that under high strain and high ozone concentration, the samples do not have time to relax. We feel that at high strain, the samples do not have the ability to relax. As indicated by the data shown *(3)* at low strain and low ozone concentration, ozone resistance of styrene rubber and natural rubber are still largely independent of elongation. It is felt that the ozone attack of relatively saturated polymers involves a mechanism different than that pertinent to highly unsaturated polymers. This will be discussed further below.

If the crack time is to be taken as representing a given fraction of the complete reaction of ozone with compound, the reorienting effect must be eliminated, and elongations greater than 200% employed, in order to obtain a meaningful expression for the dependence of ozone failure time upon concentration.

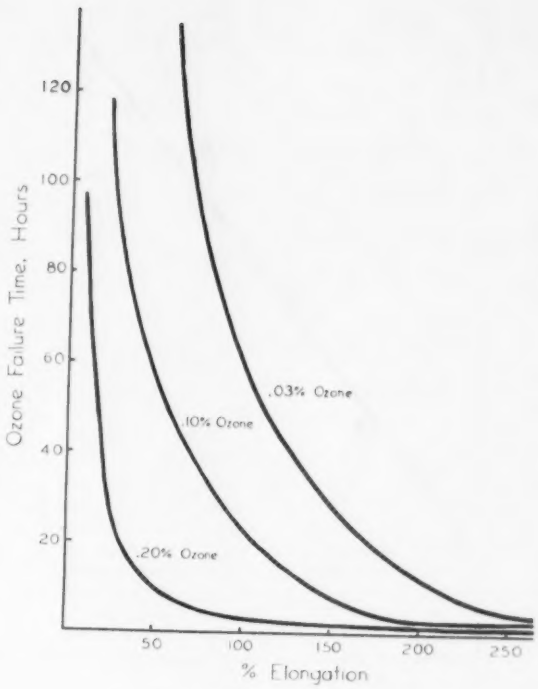


FIG. 1—Effect of elongation.

Effect of Concentration: In a system where the concentration of ozone is maintained essentially constant, the dependence of the time needed for the reaction to progress to any assigned extent, upon initial concentration, may be used to derive the order of the reaction. In Figure 2, crack time is plotted versus reciprocal concentration at 250% elongation. For a second order reaction, the time needed for a reaction to proceed to a given extent is inversely proportional to the initial concentration. The linear curve obtained indicates that the reaction is, at least roughly, second order with respect to ozone.

The simple reaction, ozone plus double bond yields ozonide, would be expected to be a bimolecular addition, hence first order with respect to ozone. In several cases *(9, 15)*, the initial and rate determining step in ozone addition to the double bond has been shown to follow such a simple course. In addition, studies of other ozone reactions *(10)* indicate that a first order dependence upon ozone concentration is to be expected in a simple reaction. Stated briefly, ozone failure time of butyl rubber vulcanizates is found to be more highly dependent upon ozone concentration than would be expected from simple ozonolysis of double bonds. A complex path is indicated. The following interpretation is proposed:

The attack of butyl rubber by ozone apparently consists of at least two degradative processes: (a) Ozonolysis of unsaturated linkages, and (b) Oxidation of activated sites in the polymer chain. The

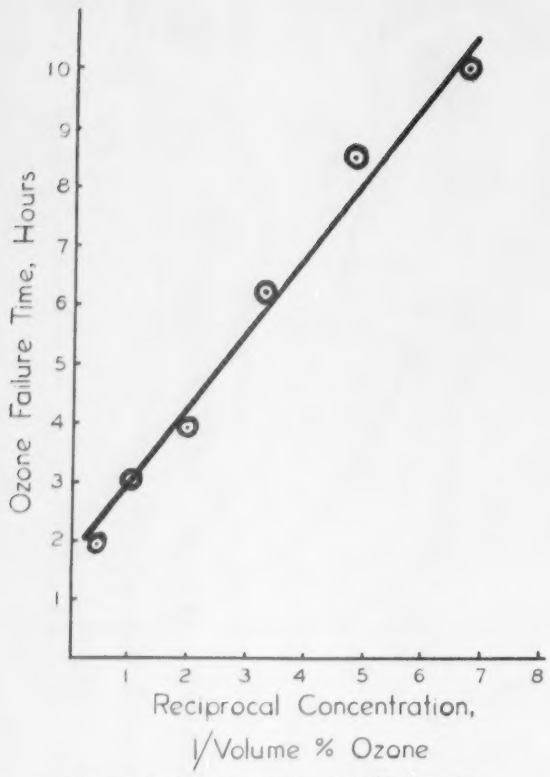


FIG. 2—Effect of concentration at 250% elongation.

latter process, which would contribute to an insignificant extent in a highly unsaturated material, becomes, in the case of the relatively saturated vulcanized Enjay Butyl 035, of great significance. In fact, it will be shown that its significance is critical.

The kinetic study of the ozonization of natural rubber by Smith and Gough *(11)*, wherein cracking is shown to be directly proportional to unsaturation, indicates that ozonolysis of double bonds is the primary degradative path involved. Similarly Rehner *(12)* employed ozone absorption as a means of estimating unsaturation in unvulcanized butyl rubber. These studies show conclusively that, in a relatively highly unsaturated polymer, mechanism (a) is of chief importance. That it is also involved in the ozone degradation of vulcanized butyl rubber is shown by the inverse dependence of ozone resistance upon per cent unsaturation *(3)*.

Ozone addition to the double bond is known to proceed with great rapidity in non-hindered cases, and would be expected to be relatively temperature independent. In fact, to discourage explosion of unstable ozonides, ozonization is commonly carried out in the laboratory at 0 to —25°C. Hence, it would be expected that styrene rubber and natural rubber would exhibit only a minor dependence of ozone failure time upon temperature. If, however, a free radical oxidation process were also involved, requiring dissociation into radicals at some stage, a marked temperature dependence would be expected. The data of Dunkel and Phelan *(3)* indicate that the ozone resistance of Enjay Butyl 035 has a high temperature dependence while styrene rubber and natural rubber, relatively none. Enjay Butyl 325 and neoprene comprise intermediate cases. This is strong evidence for the presence of both mechanisms (a) and (b) in the ozone attack of butyl rubber.

The oxidation of activated sites in the polymer chain may involve direct atack by ozone, or may result from ozone-catalyzed air oxidation. Ozone-catalyzed oxygen attack of organic substances is well known, and has been demonstrated to depend upon ozone concentration *(13)*. If such a process were involved, the ozone resistance of butyl rubber should be materially improved through compounding with standard free radical inhibiting antioxidants.

That it is not indicates that incident ozone molecules are directly participating in chain scission at activated sites. Such attack may be expected to occur at carbon-hydrogen linkages activated either inherently, e.g., the hydrogen attached to a tertiary carbon atom, or through proximity to a polymer-filler bond, or at polymer-filler bonds themselves. The ultimate ozone resistance of butyl rubber vulcanizates depends, therefore, upon the number of activated sites present at the surface of the specimen.

From this viewpoint, the deterioration of the ozone resistance of butyl rubber by reinforcing fillers *(3)* is obvious. An increase in polymer-filler bond strength and in number of polymer-filler bonds will increase the proportion of activated sites. As a corollary, halogenation of the polymer, effective in increasing saturation, and, hence, ozone resistance of unsaturated elastomers, may prove useless in the case of saturated vulcanizates. In the case of butyl rubber, the introduction of activated sites through halogenation actually lowers ozone resistance *(14)*. The efficacy of ozone as a degradative agent results from its versatility rather than specificity.

Critical Elongation: It is well known *(1)* that vulcanized polymers, when not subject to stress, have an infinitely high ozone resistance at normal temperatures, and it has been shown that there is a critical elongation, below which point ozone failure time becomes immeasurably high. In the case of vulcanizates of Enjay Butyl 035, this point occurs at an elongation as high as 10 to 20%. This observation, and the conclusions drawn above, suggest the following model for the ozone attack of butyl rubbers.

The initial reaction takes place entirely at the rubber surface. Incident ozone molecules react with antioxidants, rapidly break polymer chains ozonolytically at unsaturated sites, and in a slower process, cause scissions at activated sites. At elongations below the critical elongation, the applied stress is insufficient to cause cracking even after all of the available activated sites have been oxidized. If such a specimen is then removed from the test chamber, it would be expected that its physical properties would be relatively unaffected. This hypothesis was tested as follows.

Several samples of the standard compound were

subjected to .5% ozone for seven days at an elongation of 12.5% at room temperature. No visible cracking occurred. The tensile strength and ultimate elongation of the specimens proved to be within 5% of original values. In a similar case, several samples stretched to 25% elongation were removed from the test chamber before any visible cracking occurred. Tensile strength and ultimate elongation were retained to within 4% of the original. Before the onset of cracking, then, ozone attack is limited to the surface of the specimen.

Summary

Ozone failure time is shown to be dependent upon applied stress only when reorientation of polymer chains is possible. The second order dependence upon ozone concentration in the cracking of butyl rubber indicates that a more complicated process than simple ozonolysis of double bonds is occurring. A mechanism of simultaneous ozonolysis and oxidation is proposed. Ozone attack before visible cracking is shown to be a surface process. Future studies will be concerned with the development of a quantitative treatment of the above effects.

LITERATURE REFERENCES

(1) Crabtree, J., and Kemp, A. R., *Ind. Eng. Chem.*, Vol. 38, p. 278-96 (1946).
(2) Long, L., *Chem. Rev.*, Vol. 27, p. 437 (1940).
(3) Dunkel, W. L., and Phelan, R. R., *Rubber Age*, Vol. 83, p. 281 (1958).
(4) ASTM Standard D-412, "ASTM Standards on Rubber Products," p. 206 (1956).
(5) ASTM Standard D-1149-55T, "ASTM Standards on Rubber Products," p. 600 (1956).
(6) Greenwood, F. L., *Ind. Eng. Chem., Anal. Ed.*, Vol. 17, p. 446 (1945).
(7) Kaslow, C. E., and Stayner, E. D., *Proc. Indiana Acad. Sci.*, Vol. 54, p. 107 (1945).
(8) Smith, L. I., Greenwood, F. L., and Hurdlik, O., "Organic Syntheses," John Wiley & Sons: New York, Vol. 3, p. 673 (1955).
(9) van Dijk, J., *Rec. Trav. Chim.*, Vol. 67, p. 945 (1948).
(10) Yeatts, L. B., and Taube, H., *J. Am. Chem. Soc.*, Vol. 71, p. 4100 (1949).
(11) Smith, D. M., and Gough, V. E., *Trans. Inst. Rubber Ind.*, Vol. 29, p. 219 (1953).
(12) Rehner, J., *Ind. Eng. Chem.*, Vol. 36, p. 118 (1944).
(13) Briner, E., *Helv. Chim. Acta.* Vol. 23, p. 590 (1940).
(14) Bluestein, A. C., Unpublished material, "Study of Brominated Butyl in Electrical Insulations," (1958).
(15) Wibaut, J. P., et al, *Rec. Trav. Chim.*, Vol. 69, p. 1355 (1950); Ibid, Vol. 70, p. 1005 (1951); Ibid, Vol. 73, p. 431 (1954); Ibid, Vol. 73, p. 797 (1954).

Coming Next Month...

Effects of Highly Aromatic Gasolines on Various Elastomers—By John J. Prendergast, Thiokol Chemical Corp., Trenton, N. J.

An exploratory study to determine which elastomers are most suitable for use with the highly aromatic fuels of the present and the future.

Natural Rubber Compounds for High Temperature Service in Air—By W. P. Fletcher and S. G. Fogg, The British Rubber Producers' Research Association, Welwyn Garden City, Herts, England.

Effects of vulcanizing systems, various fillers and other variables on natural rubber vulcanizates to be used for high temperature service.

How to Get More Information from the Readings of Rotational Viscometers—By A. L. Back, A. L. Back & Associates, West Chester, Penna.

The rotational viscometer gives more information about viscous properties of fluids than is usually apparent; instructions on how to obtain additional data are given.

Surface Color Coating of Thermoplastic and Thermosetting Insulation and Jacketing Compounds—By S. Vicino, Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.

Describing an economical method of coloring insulations and jackets of wire and cable for identification purposes.

PLUS A R/A SPECIAL INDUSTRY REPORT

How to Handle Employee Grievances.

How the rubber plant manager can take a lot of the grief out of grievances.

ADVANTAGES OF Wooden Pallets for Handling Rubber Products

By WILLIAM H. SARDO, Jr.

Executive Vice President,
National Wooden Pallet Manufacturers Association
Washington 6, D. C.

THE RUBBER industry, as well as many others, has achieved increased efficiency and economy in materials handling by the use of wooden pallets and portable stacking frames. Among the advantages obtained are better utilization of existing warehouse space, improved design and construction of warehouses, reduced handling costs and shipping errors, increased accuracy and economy in inventory operations, improved warehouse appearance, and greater protection of stored products. Since the development of palletization, rubber companies are designing their new warehouses around a modern materials handling system which takes into consideration the complete usage of the cubage as well as the square footage of the warehouse, and the most efficient and cheapest methods of getting merchandise into storage and to customers.

Since the close of World War II, wooden pallets have become a part of standard storage equipment throughout American industry. In recent years they have ceased to be limited to intra-plant and warehouse use, and today, are also used to move packaged or bulk goods from one place to another. They are, in fact, now employed to carry, store or move everything from raw materials to finished product. The modern concept of palletization throughout the materials and finished product handling operation is today an accepted idea in American industry.

The major products produced by the rubber industry are of the kind that could not originally be stacked to any great height without crushing or damaging the lower layers. Automobile tires would fall over if they were stacked very high. Cartons of innertubes would crush; tread rubber would deform and stick together; sponge rubber cushion and mattress cartons would be mashed, and synthetic rubber would flow out of shape and in some instances run out of its kraft bags. Rubber manufacturers realized early that a standard wooden pallet would not work for them unless some type of supporting device to carry the load of the upper pallets was used. Thus, several kinds of stacking frames have been developed.

Tires used to be stacked by hand on the floor of the warehouse. They were laced together and placed as high as a man could reach. Only about one-half of the height of the warehouse was used. Most companies estimated they got about 2.5 tires per square foot of floor space.

In the early days of palletizing no one had enough ceiling height to stack over three pallets high. In this space 3.4 tires per square foot of floor space could be fitted. Today in modern warehouses that have twenty

National Wooden Pallet Manufacturers Association

NWPMA offers pallet users a "Technical Handbook on Pallets and Palletization," the first handbook ever written on the subject. Used as a reference book by a number of colleges and universities in the United States and overseas, it is available without cost from most pallet suppliers, or may be ordered from the Association, 609 Barr Building, Washington 6, D. C., for $1.00 (United States and Canada).

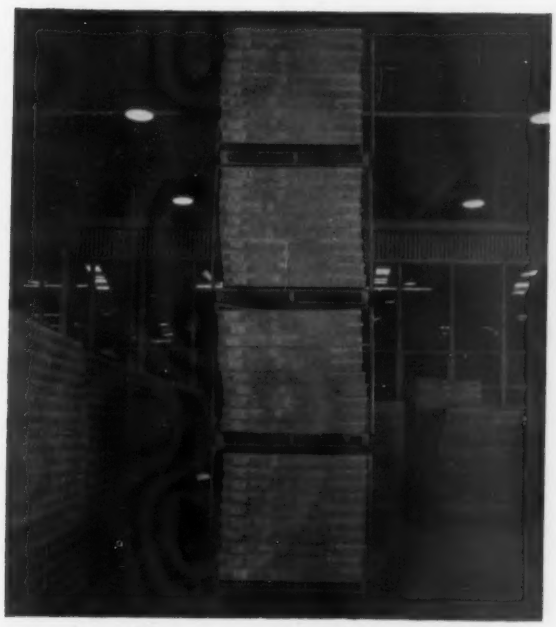
A new technical pamphlet entitled "Care for Wooden Pallets Can Control Maintenance Costs To You," is also available from the Association. It furnishes ten rules for proper repair procedures for wooden pallets, and provides data on suggested preventive and corrective measures. The pamphlet contains 21 illustrations dealing with care and maintenance of wooden pallets. This publication is free to all those who utilize pallets upon request.

Pallet users are invited to write NWPMA at any time for literature, technical advice on specifications and other matters involving wooden pallets. The organization offers its services without obligation.

feet of usable height, 4.5 tires per square foot can be stored. All of these averages take aisle and order assembly space into consideration. Palletization increases the capacities of warehouses that can stack three pallets high by 36%, and those that can stack four pallets high by 80%. Most of the warehouses that have been completed within the last two years are planned for four pallet high stacking.

Economy of Palletized Handling

When rubber companies use the hand method of stacking, it costs more than 2½ cents every time an automobile tire is handled. Each tire is handled on an average of six times, which represents a total cost of 15 cents. A palletized operation involves only three handlings at a total average cost of 7½ cents, only half as much as the cost of handling a tire by the hand method. In addition to the difference in handling costs, palletization has increased the tonnage per man-day in field warehouses from 12,000 to 18,000 pounds, including the cost of clerical and supervisory personnel. In one large rubber company's factory warehouse the tonnage per man-day increased with palletization from 12,000 pounds to 22,000 pounds, including the cost of clerical and supervisory personnel.



Storing foam rubber mattresses with pallets and stacking frames (center) offers greater protection to the product and efficiency of handling than storing without pallets (left) or with pallets alone (right).

Other large savings have been effected in the taking of inventories. Before palletization, tires had to be moved to obtain an accurate count, but now the full pallets are counted as units, and only the contents of partly filled pallets are counted individually. Errors in shipping have been reduced as much as 80%.

Now, as always, it is necessary for the tire manufacturer to get his product to the customer in good condition. When tires were laced and stacked on the floor, many tires were pressed out of their natural shape by the time they were delivered to the dealer. Palletized tires are not distorted by stacking, as only 8 to 12 tires are placed on top of one another.

Automobile tires, because of their size and shape, demand a 60 x 60-inch pallet, which will handle four stacks. One of the earlier stacking frames was a pallet with hardware inbedded in each corner. Each piece of the hardware held upright a round steel post that fitted into a cup on the lower side of the upper pallet.

Another device was four cardboard tubes, one placed in each of the four stacks of tires, to support the pallet above. Still another variation was a pallet that had a wooden fabricated member which divided the base pallet into four quadrants for four stacks of tires. This gatelike affair supported the upper pallets.

New Device the Most Efficient

The latest device, the Tier-Rack stacking frame, is the most efficient and by far the most widely used. It is manufactured in two models, one with posts on the corners of the pallet for the sizes and types of tires that require containment on the pallet as well as to serve the supporting function. Another model has supporting posts placed in the center of the edgeboards and the center of the outside stringers. The latter model allows tires to be stored that are too large

Three thousand pound fiberboard containers of synthetic rubber can now be stacked by using Tier-Rack pallets, which in this installation increased warehouse space by 70%. Stacking frames, seen on the right, nest in a small area when not in use.

to fit properly on the former. A combination of these two models of Tier-Rack stacking frames in the same warehouse makes an ideal situation. They can be placed so that the bottom pallet of a stack can be completely unloaded without any re-arrangement of stock.

One of the major rubber manufacturing companies opened a modern warehouse in the Chicago area in 1956. This warehouse occupies an area of 135,000 square feet, of which 20,000 square feet are utilized by railroad tracks, shipping, receiving and office space. For this warehouse the company purchased 3,528 pallets and Tier-Racks, 2,500 with supporting posts in the center of the edgeboards and outside stringers, and 1,028 with posts placed on the corners. These pallets and stacking frames were originally purchased for tire storage but they are now used for the storage of other rubber products such as industrial hose, sponge rubber mattresses and cushions, rolls of foam rubber cushion stock, foam rubber automobile seat cushions, and kraft-wrapped bales of synthetic rubber.

At this installation, automobile, truck and farm tractor tires are stacked four pallet loads high. Two pallets are handled at one time by fork truck. Only two fork trucks are used to take all merchandise to storage areas and bring all orders to the shipping area. This warehouse has a capacity of 150,000 tires and was planned for a work force of twelve men. Efficiency has developed to the point that only eight men are now employed in its operation.

Another rubber company has a warehouse adjoining its factory. After it palletized it lost 24,000 square feet of this warehouse to production, and at the same time increased storage capacity by 40,000 automobile tires. Before palletizing the tonnage handling was 12,000 pounds per man-day; this was increased to 22,000 per man-day. Tires are palletized from a conveyor and carried into the storage area by fork truck, two pallets each trip. Six thousand tires per day are sorted and palletized by two men per shift on a three-shift basis. An addition to this warehouse where tires are stacked four pallets high has been built. Today the installation has a capacity of 400,000 automobile, truck and farm tractor tires.

Most rubber companies are palletized at the distribution warehouse level. One large company has developed a system for picking orders that has reduced assembly cost by as much as 65%. In its warehouses one man picked 405 orders in 10½ hours. Mistakes in shipping have also been reduced 80%, a savings which could not be possible if this operation were not completely palletized.

In addition to reduced internal costs, trucks pick up orders much faster than before. This company also stores tread rubber on a pallet with a Tier-Rack and an attached shelf. By this method, personnel can separate die sizes and manufacture dates so that they can effect a first-in first-out system of shipping and also protect the cartons from crushing and the tread rubber from damage by compression.

Storing Unprocessed Rubber

The rubber industry has other storage problems besides those connected with finished goods. Both natural rubber and synthetic rubber posed palletization difficulties that were solved with wooden pallets and stacking frames. Natural rubber comes to the factories in odd-shaped bales. When palletized, the load has an uneven top. In addition, natural rubber gives under compression, so that stacks are very unstable. By applying corner post stacking frames to base pallets, as many as five pallets can be placed on top one another to form stacks which remain stable.

Synthetic rubber posed a real problem to both the automobile tire manufacturers and to its producers. Man-made rubber is packed in two basic containers.

One is single bales which are individually wrapped in paper or in paper bags, and the other is a three-sleeve cardboard container holding several bales which weigh a total of about 3,000 pounds.

When the paper-wrapped bales are palletized and one pallet stacked upon another, the synthetic rubber will not support the upper loads. Bags burst and stacks fall or lean against adjacent stacks. By attaching the corner post type Tier-Rack to a base wooden pallet and loading the bales thereon, both stability of the stack and containment of the merchandise is obtained. The 3,000 pound cardboard containers present an entirely different problem. It is impossible to stack these one upon another due to the nature of the synthetic rubber and the weight of the load. This problem has also been solved by the use of a Tier-Rack pallet. Warehouse space has been increased by more than 70% without loss of efficiency of mechanical handling equipment.

Pallets Must Be Used Properly

Like any other type of materials handling equipment, wooden pallets give maximum, trouble-free service when not abused. Properly designed and constructed, they perform under specific operating conditions, and offer real advantages to users.

Although some pallet damage is unavoidable, many pallets are injured because of carelessness on the part of personnel engaged in their handling. Based on the experience of thousands of users over the years, the National Wooden Pallet Manufacturers Association has compiled a set of rules to be followed in preventing and minimizing pallet damage. They are listed elsewhere in this article.

Neglect of pallets after they are in use can be one of the most costly practices encountered in materials handling. On quick observation the decision when to repair and when to discard pallets may appear difficult, but upon analysis it is found to be relatively simple. By far the great majority of wooden pallet damages can be repaired economically, quickly and readily. Intelligent use of this materials handling equipment means greater efficiency and added savings for the rubber and rubber goods manufacturer.

How to Use Wooden Pallets Properly

(1) Drive handling equipment carefully into position and engage the load properly; equipment should be square with the load.

(2) Drive equipment forward until the load touches the carriage; do not bump or jar loads.

(3) Space forks of handling equipment as wide as possible to provide more equal distribution of weight; make certain that forks are spaced evenly from center stringer or blocks.

(4) When engaging the pallet, keep the forks level; do not drag the forks on the floor, nor enter or withdraw from pallet openings with tilted forks.

(5) In entering or withdrawing from the pallet, do not strike the stringer or blocks with the forks.

(6) Do not slue the pallet around with one fork in order to line it up for two-fork entry.

(7) Do not remove the top pallet in a pile by sliding it off, and allowing it to fall to the ground; such practice loosens the fastenings and also causes damage to the deckboards.

(8) Do not improperly load or overload a pallet, as this can result in broken deckboards due to uneven distribution of load.

(9) When shipping on pallets, do not strap objects to them which have a bottom surface area smaller than the deck of the pallet, thus pulling off top deckboards.

Testing Aircraft Refueling Hose

HEWITT Rubber Division of Hewitt-Robins, Inc., tests jet aircraft refueling hose in a minimum amount of time at its Buffalo, N. Y., plant by using a conveniently operated test stand that checks a length of hose in only three minutes. The stand consists of a Deming centrifugal pump, a reservoir tank and a recirculating line with connections for the hose. Jet engine fuel, or an equivalent liquid, is pumped under pressure through each hose length which is being tested.

The end suction centrifugal draws fuel from the tank and pumps it at a rate of 200 gallons per minute through the hose. Operating pressure varies from 45 to 60 psi. The fuel is pumped through the hose and back into the tank in continuous circulation.

Test operators connect a hose length and start the pump. They regulate the flow through the hose by closing a gate valve on the inlet side of the hose. They then observe the pressure drop indicated as the difference between pressure at inlet and outlet ends of the hose.

After the test proves the hose meets military specifications, gate valves are closed at both ends of the circulating system. Compressed air forces the fuel out of the hose through a by-pass line back into the tank. The hose is removed and the next test begins.

Hewitt-Robins checks approximately twenty lengths of refueling hose per day at the test stand. Alternate couplings provide for checking 2 inch and 1½ inch I.D. hose.

BEHAVIOR OF Silicone Rubber

in sealed systems at high temperatures

By W. J. BOBEAR

Silicone Products Department, General Electric Co., Waterford, N. Y.

SILICONE rubber has a 15 year history of successful service at high temperatures, often in partially or completely sealed systems. Examples of such applications are O-ring seals and gaskets in aircraft and diesel engines, auto transmissions and gas turbine engines *(2, 3)*. The rubber has also found wide acceptance in aircraft heater duct systems, where temperatures go as high as 600 to 700°F.

The use of silicone rubber in such applications is based on its superiority over other elastomers in resistance to permanent set and compression set under severe operating conditions. But in spite of the many successful applications and corresponding functional data obtained from them, very few physical property data have been available on aging in completely sealed systems. This lack of information contrasts greatly with the extensive physical data on the properties of the rubber after heat aging in freely circulating air *(1-5)*. Data on sealed system behavior, if available, would provide basic facts that would permit a more effective screening of silicone rubber stocks prior to undertaking the more expensive and time-consuming functional tests. It would also serve as a guide to the proper fabrication and application of the rubber in sealed systems.

In this work, the properties of silicone rubber in completely sealed systems at high temperature were followed by measuring the normal property profile—hardness, tensile strength and elongation. The formulation, processing and environmental variables that affect the behavior of the rubber were defined.

Effects of Polymer and Cure

One of the first variables considered was the polymer. It has long been known that the compression set of silicone rubber can be improved by substituting vinyl groups along the polymer chains *(6)*. The effects of the use of methyl vinyl gum and of degree of cure on the compounds made with Cab-O-Sil and benzoyl peroxide are indicated in Table I. All samples were made in standard 6 x 6 inch ASTM slabs and press cured for ten minutes at 270°F. The slabs were post baked one hour at 300°F. before they received the cures shown in Table I.

The samples were then die cut into ½ x 4-inch strips and the durometer, tensile strength and elongation of each stock were measured at room temperature by the conventional ASTM procedures. Strips of each rubber sample were then sealed in pyrex glass tubes. There were two tubes per sample and four strips per tube. Each tube had a volume of approximately 25 cc. and contained about 10 cc. rubber. The sealed tubes were heated for two days at 400°F. The rubber strips were then removed from the tubes and retested at room temperature.

The methyl gum stock, cured at 300°F., deteriorated badly. This "reversion" of properties is due to depolymerization of the silicone gum. Experience has shown that the phenomenon can be inhibited and controlled. For example, the methyl gum stock improved considerably in performance when it was cured at 480°F. before test. The effect of cure is also noticeable with the methyl vinyl gum stock. However, this sample is considerably better than the methyl at both cures. In fact, it shows essentially no change in properties if cured at 480°F. before the sealed tube test (Table I).

Methyl vinyl gum and a post bake of 24 hours at 480°F. were used in fabricating specimens for the tests shown in Table II. In this test series the effects of three reinforcing silicas and two peroxides are presented. The samples were heated in sealed tubes for 24 hours at 480°F. The results are shown in terms of the actual level of tensile strength after the test and in terms of percentage change in durometer during the test. It is apparent that Cab-O-Sil is the best of the three fillers for use in sealed systems, while HiSil is the least effective.

There is also some evidence that a neutral peroxide, such as di tertiary butyl, may be better than a peroxide with acidic decomposition products, such as benzoyl. The difference in peroxide effects on proper-

TABLE I—EFFECT OF GUM TYPE AND CURE

Aged 2 Days @ 400°F.—sealed

	Before			After		
	Duro. Shore A	Tensile (psi)	Elong. (%)	Duro. Shore A	Tensile (psi)	Elong. (%)
Original Cure: 24 hr./300°F.						
Methyl gum	60	1000	250	42	100	30
Methyl vinyl gum	70	1050	280	67	500	250
Original Cure: 24 hr./480°F.						
Methyl gum	60	800	180	57	575	150
Methyl vinyl gum	70	750	260	70	650	240

Note: This paper was presented before the Division of Rubber Chemistry ACS, at Cincinnati, Ohio, May 15, 1958.

TABLE II—EFFECT OF VARIOUS REINFORCING FILLERS AND PEROXIDE TYPE

Original cure: 24 hr./480°F.;
Aged: 24 hr./480°F., sealed

Filler	Duro. Shore A (% Change) BPO	DTBP	Tensile Strength (psi) BPO	DTBP
Cab-O-Sil	—15	—10	375	475
Santocel CS	—15	—15	0	215
Hi-Sil X-303	—44	—27	0	0

BPO = Benzoyl peroxide; DTBP = Di tertiary butyl peroxide.

TABLE IV—PHYSICAL PROPERTIES OF TWO COMMERCIALLY AVAILABLE FUME SILICA COMPOUNDS—50 DUROMETER

Condition	Compound A Duro. Shore A	Tensile (psi)	Elong. (%)	Compound B Duro. Shore A	Tensile (psi)	Elong. (%)
1	52	890	290	54	855	260
2	43	680	370	51	760	330
3	Too weak to test			35	70	70

Conditions: 1 = Original cure: 24 hr./480°F.; 2 = Aged 1 wk./300°F./saturated steam-sealed; 3 = Aged 24 hr./480°F./sealed, after conditioning 1 wk./77°F./75% RH.

ties would be very marked in rubber that was post baked for shorter times than 24 hours at lower temperatures than 480°F.

In addition to indicating the importance of gum, filler and peroxide selection, the data also show that durometer is at best an insufficient measure of property changes. One compound had a residual tensile strength of 375 psi with a 15 per cent drop in hardness; another had no tensile strength at all with a 15 per cent hardness drop.

Sensitivity to Moisture Level

Attempts to duplicate these results a few months later revealed some basic difficulty in the test method. The relationships outlined previously were maintained, but the entire level of results varied from one test time to another. At least as long ago as 1944, it was known that silicone rubber properties degraded with heat in the presence of water *(7)*. More recently, it was shown that the amount of degradation increased with increase in water level, particularly in the presence of acidic and basic catalyst *(8-10)*. Therefore, it seemed possible that the results in Tables I and II might be more sensitive to moisture level than was originally suspected.

In Table III, it is quite readily seen that the test results are sensitive to moisture level. The stock tested was compounded from methyl vinyl gum with Cab-O-Sil and benzoyl peroxide. The slabs were post baked 24 hours at 480°F. They were then cut into ½ x 4-inch strips and placed in the tubes. The tubes were necked down. Before sealing, they were conditioned as indicated in the table. All sealed tubes were heated 24 hours at 480°F. It is apparent that the lower the water level in the tube, the less the properties change with heat in a sealed system. This sensitivity to water level also suggests a possible explanation for the behavior of the three reinforcing silicas of Table II. The Cab-O-Sil used in those experiments contained 0.5% water removable in one hour at 110°C.; the Santocel CS, 1.8%, and the HiSil, 4.6% *(11)*.

TABLE III—EFFECT OF WATER LEVEL ON STOCK COMPOUNDED FROM METHYL VINYL GUM, CAB-O-SIL AND BENZOYL PEROXIDE

Original cure: 24 hr./480°F.;
Aged: 24 hr./480°F., sealed

Sample Conditioning	Duro. Shore A	Tensile (psi)	Elong. (%)
1 wk./80°F./60% RH	59	475	210
1 wk./80°F./100% RH	53	160	110
16 hrs./80°F./100% RH + Sealed with 1 drop H_2O	Too weak to test		

After the effect of water level had been clearly delineated, two very severe short time screening tests were developed. In the first method, the four strips of rubber (volume = 10 cm^3) are sealed in a 40 cm^3 pyrex glass tube with 0.2 cm^3 water. The sample tube is then heated for one week at 300°F. The water present is sufficient to provide saturated steam pressure in the order of 4 to 5 atmospheres at test temperature. In the second method, the four rubber strips are placed in a pyrex glass tube. The tube is necked down, and then it is conditioned for one week at 77°F. and 75% relative humidity. Next, it is sealed to a final volume of 40 cm^3. The tube is then heated for 24 hours at 480°F.

Results of Moisture Screening Tests

These two tests were run on the two 50 durometer fume silica compounds listed in Table IV. Condition 1 represents the original properties after the 24 hour at 480°F. post bake. Condition 2 shows the properties of these rubbers after the saturated steam test, and Condition 3 indicates the properties after the 480°F. test. The samples were badly deteriorated after the 24 hour at 480°F. test, while they were in good condition after the test in saturated steam at 300°F. Results on the two 70 durometer compounds in Table V are similar. The data in these last two tables are representative of the best silicone rubbers now commercially available for use in sealed systems and provide a base line for rapid screening of silicone rubber stocks.

Prior to the screening work just described, long term aging tests were started at 300 and 400°F. The results are presented in Figures 1 and 2. The samples for these tests were compounded with methyl vinyl

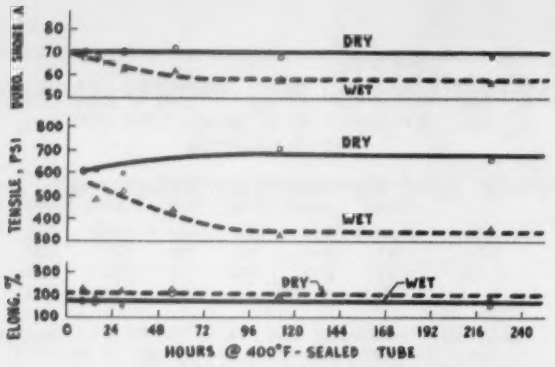


FIG. 1—Effect of aging and water level at 400°F. (Original cure = 24 hr./480°F.; Sample conditioning = Dry: 1 wk./90°F./30% RH — Wet: 1 wk./80°F./100% RH.)

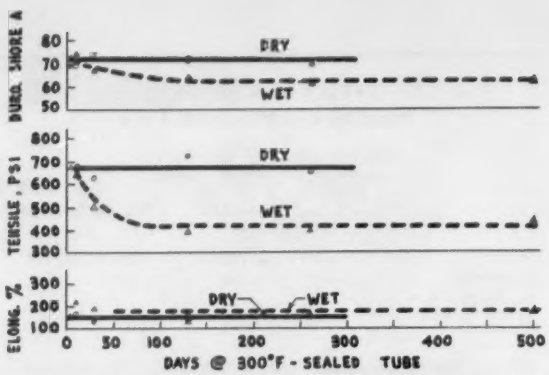


FIG. 2—Effect of aging and water level at 300°F. (Original cure = 24 hr./480°F.; Sample conditioning = Dry: 1 wk./90°F./30% RH — Wet: 1 wk./80°F./100% RH.)

gum, Cab-O-Sil and benzoyl peroxide. All were cured 24 hours at 480°F., conditioned and then sealed in tubes. The "wet" samples were conditioned one week/80°F./100% RH before sealing, while the "dry" samples were conditioned one week/80°F./30% RH before sealing.

At 400°F., the dry sample was essentially unchanged when the tests were discontinued at 224 hours. The durometer of the wet sample dropped from 70 to 58 in about 100 hours and then remained unchanged to 224 hours. At the same time, the tensile strength leveled at about 340 psi.

At 300°F., the dry sample was essentially unchanged when the tests were discontinued at 256 days. The durometer of the wet sample dropped from 72 to 62 in about 125 days and then remained unchanged to 500 days. During the same time, the tensile strength leveled at about 400 psi.

The data presented in this paper obviously cannot be extrapolated to predict behavior under application conditions. The work simply offers a basis for screening silicone rubber stocks, and more precisely defines the variables that fabricators and end users consider in the compounding and application of silicone rubber in sealed systems. The usefulness of the rubber in such systems has already been demonstrated by experience. More precise knowledge of its properties and behavior simply permits maximum exploitation of this usefulness, and points the way to further improvements.

TABLE V—PHYSICAL PROPERTIES OF TWO COMMERCIALLY AVAILABLE FUME SILICA COMPOUNDS—70 DUROMETER

	Compound C			Compound D		
Condition	Duro. Shore A	Tensile (psi)	Elong. (%)	Duro. Shore A	Tensile (psi)	Elong. (%)
1	71	950	200	67	975	200
2	67	580	190	67	775	200
3	Too weak to test			50	140	30

Conditions: 1 = Original cure: 24 hr./480°F.; 2 = Aged 1 wk./300°F./saturated steam-sealed; 3=Aged 24 hr./480°F./sealed, after conditioning 1 wk./77°F./75% RH.

Summary

In summary, the most critical compounding consideration is the choice of filler. A fume silica, such as Cab-O-Sil, is best. Less important, but quite helpful, is the choice of a gum containing vinyl groups. Still less important, but helpful in some cases, is the choice of a peroxide curing agent with neutral decomposition products.

In fabrication, it is important that the rubber be cured at high temperature for a reasonably long period. And finally, in application design, it is important to provide as much ventilation as possible. If the part is to be completely sealed, it should be dried as thoroughly as possible before sealing.

ACKNOWLEDGEMENT

The author wishes to thank Arnold Torkelson and A. C. Martellock for helpful discussions. He is indebted to M. G. Noble for the data in Table I and to Dr. Torkelson for suggesting the saturated steam test.

LITERATURE REFERENCES

(1) White, B. B., "Silicone Rubber For High Speed High Altitude Flight," *Aero Digest* (January, 1952).
(2) Dow Corning Corporation, "Silastic Facts No. 10a" (May, 1952).
(3) White, B. B., and Spalding, D. P., "Silicone Rubber—Its Resistance to Fluid Media in Aircraft Applications," paper presented at a symposium sponsored by SAE Committee AE-1, Joint Aircraft Engine and Accessory Installations at Cleveland, Ohio, (May, 1954.)
(4) Noble, M. G., "New Developments in Silicone Rubber Compounds for Extruded Electrical Insulation," *Wire and Wire Products* (February, 1957).
(5) Mulvey, B. J., "New Trends in High Temperature Cables," *General Electric Review* (March, 1957).
(6) Marsden, J., U.S. Patent No. 2,445,794 (1948).
(7) Marsden, J., Unpublished data (1944).
(8) Lewis, F. M., Unpublished data (1952).
(9) McLoughlin, J. R., Unpublished data (1954).
(10) Osthoff, R. C., Bueche, A. M., and Grubb, W. T., *JACS*, Vol. 76, p. 4659 (1954).
(11) Bobear, W. J., and Lyle, R., Unpublished data (1956).

Absorptiometric Determination of Traces of Copper in rubber chemicals and products

By R. C. MADAN
Firestone Tyre & Rubber Co., Ltd., Brentford, Middlesex, England

THE METHOD of absorptiometric determination of traces of copper in rubber chemicals and rubber products described in this paper is based on treating the sample under test with zinc dibenzyl dithiocarbamate reagent and simultaneously extracting the copper complex thus formed with carbon tetrachloride in an acid medium. The intensity of the color developed is measured on a spectrophotometer and compared against a previously calibrated curve. This method is an extremely sensitive and time saving one. An experienced analyst can complete the determination of, for example, copper in the zinc oxide, in about 20 to 30 minutes.

Zinc dibenzyl dithiocarbamate is a white solid with a molecular weight of 610.16 and a melting point of 176°C. It has the following composition and formula:

$$\left[(C_6H_5 \cdot CH_2)_2\,N.CS.S\right]_2\ Zn$$

It is used in the rubber industry as an accelerator and sold under the trade name Arazate. Abbott and Polhill *(1)*, who have successfully used it for the determination of copper in fats and oils, have given details of its manufacture and purification. Stone and Ettinger *(2)* and Timberlake *(3)* have used this reagent for determination of traces of copper in alcoholic beverages.

Its great advantage over sodium diethyl dithiocarbamate reagent is that it can be used in moderate concentrations of mineral acids, and thus the "negative error" due to precipitation of copper together with iron is avoided. It is very stable and its dilute solution—0.02% in carbon tetrachloride—will remain clear and potent for over a month. Stone and co-workers have used up to 0.5% (reagent) solution but weaker solution—0.02%—is recommended. The presence of excess reagent in the final extract under spectrophotometric check does not interfere in the visible region of the spectrum. As shown in Figure 1, Arazate has an absorption maximum at 268mμ using chloroform as the solvent. (Carbon tetrachloride is opaque at this wavelength.) The color developed by the copper complex is also very stable and remains unaffected for nearly one-half hour even by direct sunlight.

Various solvents, e.g., ethyl ether and chloroform, were tried as an alternative for extracting the copper complex, but carbon tetrachloride is found to be most suitable. As the reagent is soluble in carbon tetrachloride, the copper complexing and extraction can be carried out at the same time, resulting in simplicity in procedure.

Ethyl ether is perhaps the next best solvent. But as it is highly volatile, it would entail extra precautions to avoid "positive error" resulting from evaporation of solvent and thus higher concentration of the sample under check. Secondly, for the sake of simplicity in technique, a solvent which forms an upper layer in the separator is not practicable for several consecutive extractions.

Method

Reagents. The reagents are:

2N Sulfuric acid A.R.

4N Hydrochloric acid A.R.—for copper in calcium carbonate.

0.02% solution of zinc dibenzyl dithiocarbamate in A.R. carbon tetrachloride.

Carbon tetrachloride A.R.

Sodium sulfate (anhydrous) A.R.

Procedure for Zinc Oxide. The procedure for determining the copper in zinc oxide is to weigh one gram of sample in a 50 ml. beaker. Wet it with a

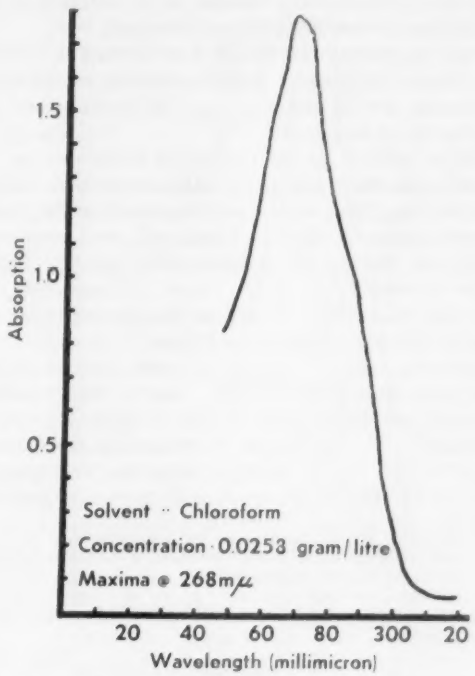


FIG. 1—Absorption spectrum of zinc dibenzyl dithiocarbamate.

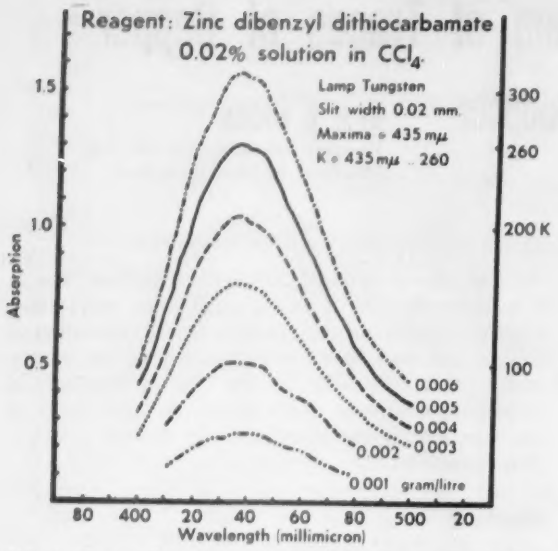


FIG. 2—Copper determination—optical density curves at various concentrations.

little distilled water and while covered with a watch glass add to it about 15 ml. of 2N sulfuric acid to effect solution. After the solution is complete transfer it to a 100 ml. capacity glass stoppered separating funnel. (The lower ends of the separating funnels below the stopcocks should be perfectly dry. Use filter paper to suck any moisture. The stopcocks should not be greased, but instead lubricated with pure carbon tetrachloride.) Rinse the beaker with more 2N sulfuric acid and add it to the solution in the separator. Increase the volume of the solution to the 40 ml. mark with more 2N sulfuric acid.

Add to it about two ml. of 0.02% reagent solution in carbon tetrachloride. Replace the stopper and shake vigorously for 30 seconds. Let the funnel stand for the two layers to separate.

While waiting for the two layers to separate in the funnel, run the blank in the other separator. By the time the reagent is added and shaken up in the blank, the two layers in the first funnel will have separated. Carry on the second extraction in the first funnel while the two layers in the blank are separating. In this way the sample as well as the blank can be run side by side without any loss of time.

Run the organic solvent layer into a clean dry ten ml. glass stoppered cylinder. Repeat the extraction process with three more two ml. portions of reagent solution*. The volume of the extract in the cylinder at this stage should be about nine ml. Increase the volume to the ten ml. mark with pure carbon tetrachloride, adding it dropwise, washing down any extract adhering to the mouth of the cylinder.

* If the final extract solution in the separator does not turn absolutely colorless in the fourth extraction, it should be extracted with more portions of reagent solution until it comes out colorless. In this case, make the final volume of copper carbamate complex in carbon tetrachloride 25 ml. instead of ten ml. If this is done,

$$\% \text{ copper} = \frac{\text{Absorption (E)} \times 100}{260 \times \text{wt. of sample in grams} \times 40},$$

RECOVERY OF COPPER IN THE PRESENCE OF FOREIGN IONS OR MATERIAL

Foreign ion or material	Weight (g)	Weight added to blank (g)	% Cu as impurity in added material	Cu added (g)	Cu recovered (g)
Fe^{++}	0.50	0.5	—	0.00003	0.00003
Fe^{+++}	0.01	—	0.002	0.00003	0.0000302
Fe^{+++}	0.04	—	0.002	0.00003	0.0000308
Zn^{++}	0.20	0.2	—	0.00003	0.00003
Zn^{++}	0.50	0.5	—	0.00003	0.00003
ZnO	1.00	1.0	—	0.00003	0.00003
Ca^{++}	1.00	1.0	—	0.00003	0.00003
Al^{+++}	0.50	0.5	—	0.00003	0.00003
China clay	1.00	1.0	—	0.00003	0.00003
Mn^{++}	0.50	0.5	—	0.00003	0.00003
Pb^{++}	0.50	0.5	—	0.00003	0.00003

Run a blank side by side starting with 40 ml. of 2N sulfuric acid in another pair of separator and ten ml. graduated cylinder. Add to the two cylinders—one with the sample extract and the other with the blank—about one gram of anhydrous sodium sulfate. If the extract is slightly turbid due to the presence of moisture, the addition of sodium sulfate (anhydrous) will turn it clear. Replace the stoppers, shake and let stand.

Decant from the top the clear sample extract as well as the blank into 1.00 cm. cells. Measure absorption on a spectophotometer at wave length 435mμ using a tungsten lamp, slit width 0.02 mm., balancing the spectrophotometer at 0.00 absorption with the blank. It is always advisable to check the reagent blank against pure carbon tetrachloride to see that the absorption due to it is well below 0.1, or not higher than 1/10 of the absorption due to the sample.

Calculations. The copper content is determined by the equation

$$\% \text{ Cu} = \frac{E \times 100}{K \times C}$$

where E = the absorption, or optical density, which is $\log_{10}$ 100/% transmission.
$K = E^{0.1\%}_{1\text{ cm}}$, the specific extinction coefficient of copper which is substituted as 260 at 435mμ under these conditions, and
C = concentration in gram/liter of the final extract in carbon tetrachloride.

If the volume of the final extract solution is ten ml., and the weight of the sample taken is one gram, then

$$\% \text{ Cu} = \frac{E \times 100}{260 \quad \text{wt. of sample in grams} \times 100} = \frac{E}{260}.$$

Procedure for China Clay and Calcium Carbonate. To determine the copper in china clay, weigh a one gram sample in a 150 ml. beaker. Add to it 40 ml. of 2N sulfuric acid and digest it on a hot plate for one-half hour. Filter it through 540 Whatman filter paper into a separating funnel. Increase the volume

of filtrate to 40 ml. with distilled water. Then proceed with the extraction using the zinc dibenzyl dithiocarbamate reagent as described for zinc oxide.

For calcium carbonate place a one gram sample into a 150 ml. beaker. Wet it with distilled water and while covered with a watch glass add to it 40 ml. of 4N hydrochloric acid instead of sulfuric acid. Filter it into the separator and treat the filtrate with the reagent as described for zinc oxide. Run the blank with 40 ml. of 4N hydrochloric acid.

Rubber and Rubber Products

Milliken *(4)* as a result of his investigations into the ashing techniques and the possible loss of copper or copper salts on dry heating using various types of crucibles, has recommended a procedure for dry ashing of rubber and rubber products at 550°C., which is believed to be as reliable and accurate as the more laborious and time consuming wet oxidation process suggested by B.S.I. *(5)* and A.S.T.M. *(6)*. According to him, the loss of weight of copper heated at 550°C. does not amount to more than 0.3 to 1.0% per hour, which is negligible compared to other possible sources of error in A.S.T.M. and B.S.I. methods, e.g., coprecipitation of copper together with iron in an alkaline medium.

To determine copper in rubber, take a 2 to 4 gram sample (or enough sample to contain 40 to 60 micrograms of copper), wrap it in ashless filter paper and place it in a glazed porcelain crucible with clean unetched inside walls. Place the crucible in a muffle furnace at 550°C., and close the door of the muffle immediately; or cover the crucible with a lid with a small hole in it and heat it over a small flame. See that the rubber vapor does not ignite.

When all the volatile matter is expelled, heat the crucible on a bunsen flame. Ash it until no carbon particles are visible. The crucible is then removed, cooled and ash digested in eight ml. of 50% sulfuric acid for one-half hour. With the help of a jet of water from a wash bottle, transfer the solution without filtering to a 100 ml. separating funnel. Increase the volume to the 40 ml. mark and proceed with the extraction as discussed in reference to zinc oxide. Run the blank starting with the same quantity of sulfuric acid as used for ash digestion.

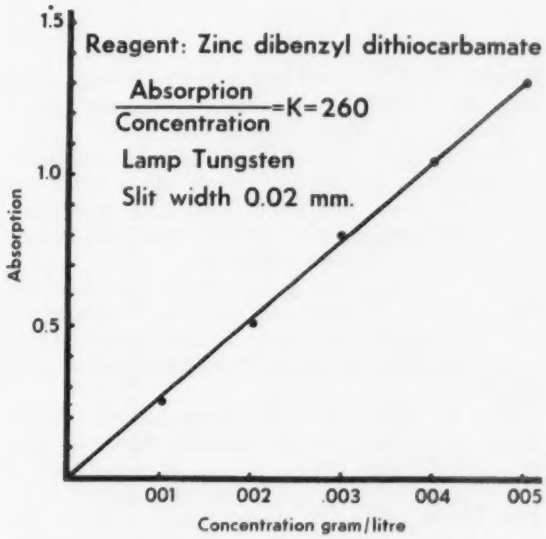


FIG. 3—Copper determination—optical density at various concentrations at 435mμ.

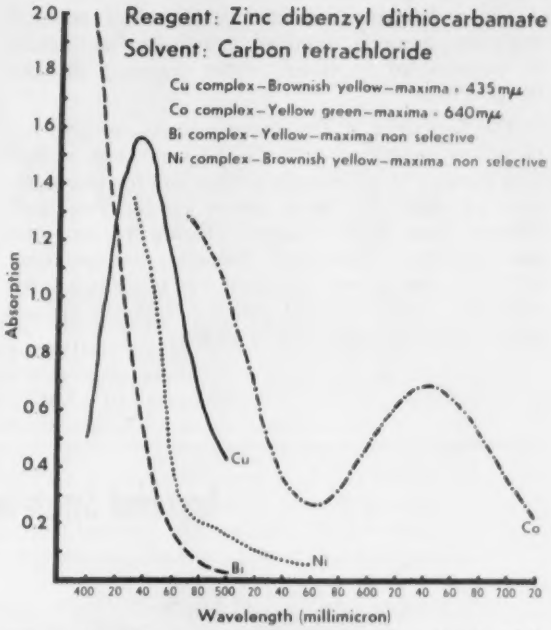


FIG. 4—Absorption spectra of copper, cobalt, bismuth and nickel.

Calibration

Following the technique suggested above, a series of samples containing from 0.01 to 0.07 mg. of standard copper were prepared and treated with ten ml. of reagent solution (final concentration 0.001 to 0.007 gram/liter).

The optical density curves at various concentrations were then plotted over the wavelength range 380 to 520mμ using a Unicam S.P. 500 spectrophotometer and 1.00 cm. stoppered and matched silica cells supplied by Thermal Syndicate Ltd. (glass cells can also be used over this wavelength range with equal accuracy). The copper complex was found to have the absorption maximum at 435mμ (Figure 2). A graph of concentration of copper against absorption shows close conformity to Beer's law (Figure 3).

Interference from Other Cations

Metallic ions or materials ordinarily present in rubber chemicals or products do not present any difficulty in the complete recovery of traces of copper as

shown in the table. Bismuth, nickel, cobalt, mercury and silver, however, interfere, though they will hardly be encountered in either rubber pigments or rubber products.

The first three in the absence of copper give rise to yellow complexes with the reagent which absorb very strongly at wavelength 435mμ. But the characteristics of their absorption curves are however quite different from that of copper (Figure 4), and they can easily be differentiated. Moderate concentrations of ferric iron do not interfere, but too much ferric iron will form a colored complex with the reagent which might be interpreted as copper.

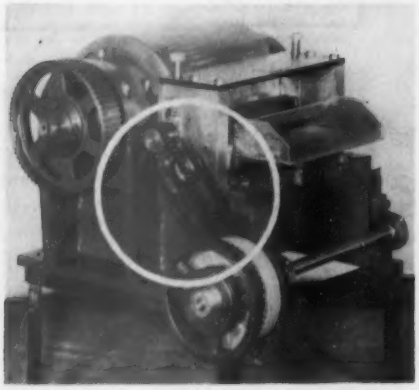
ACKNOWLEDGMENT

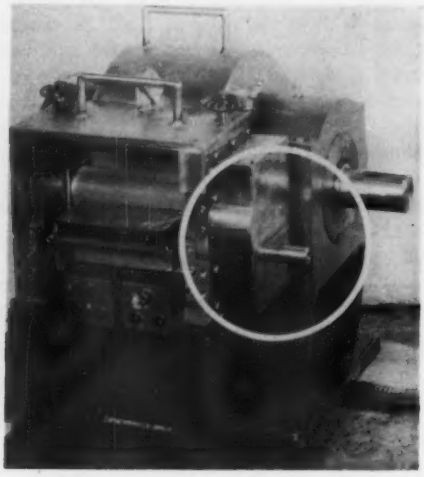
The author acknowledges with grateful thanks the permission of Firestone Tyre & Rubber Co., Ltd. to publish this work.

LITERATURE REFERENCES

(1) Abbott, D. C., and Polhill, R. D. A., *Analyst*, Vol. 79, p. 547 (1954).
(2) Stone, I., Ettinger, R., and Gantz, C., *Anal. Chem.*, Vol. 25, p. 893 (1953).
(3) Timberlake, C. F., *Chem. & Ind.*, Vol. 47, p. 1442 (1954).
(4) Milliken, L. T., *Rubber Age*, Vol. 71, p. 64 (1952).
(5) *B.S.I.*, 903, p. 62 (1950).
(6) A.S.T.M., Committee D-11 (D-297-50-T and D-1076-49-T) (1951).

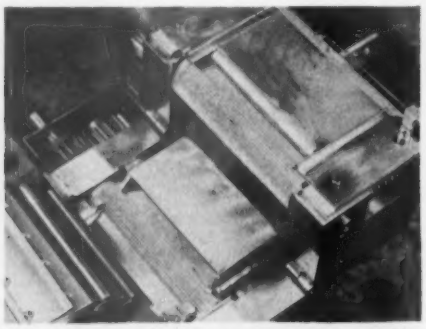
Improved Synchronization of Feed Rolls





Chain drives formerly used on the feed rolls of plastic pelletizers (circled in above photograph) have been replaced by gears enclosed in a grease-proof cover (circled area in figure at the right).

IMPROVEMENTS aimed at keeping the feed rolls of its plastic pelletizers and other machines perfectly synchronized have been announced by Taylor, Stiles & Co., Bridge Street, Riegelsville, New Jersey.



Feed rolls and bed knives are now easily accessible by opening the split side pieces, as shown above.

Formerly each feed roll was driven by a roller chain from the countershaft. Chains, however, are difficult to enclose, and require frequent lubrication.

Now the feed rolls are driven by gears completely enclosed in a grease-proof cover. As a result two roller chains and one countershaft have been eliminated. Oil throwing is prevented. Feed rolls are said to be kept in perfect synchronization.

These changes also make possible an additional improvement. Formerly the side pieces carrying the feed rolls were in one piece. To get to the feed rolls it was necessary to remove two chains and unscrew several nuts.

Now the cutters have side pieces that are split between the top and bottom feed rolls. By simply loosening a handwheel the top roll can be swung back on a hinge, giving clear access to feed rolls and bed knife. This design makes the machine easy to clean; and since no wrench or screwdriver has to be used, there is no need for the services of mechanics.

EDITORIAL

TRADE paper editors, by virtue of their intimate relation to an industry, are forced to take positions on many issues of the day. At year-end, it is often enlightening to review the positions we have taken. In our January, 1958, issue, for example, we concerned ourself with the economic state of the nation. To this end, we related an anecdote which pointed to a small moral. To wit: It is possible for a people to talk themselves into a state of economic despair.

In our February issue, we considered the matter of fundamental research and the need for some centralized research activity where rubber is concerned. In March we adjusted our target to two sights: One of these concerned the need for accelerated sales activity and personal sales service. The second editorial in March covered the general economy and the rubber industry in particular.

By April we began to be a bit concerned about the natural rubber segment of the industry. We paid some attention to price levels and some of the factors affecting the move of natural rubber on the Commodity Exchange. In May we found an issue worthy of extended editorial treatment. Here we spoke about the Soviet threat, particularly where synthetic rubber is concerned. We noted that the capacity of the Soviet bloc nations to produce and market synthetic rubber poses a hazard to North American manufacturers. This editorial, incidentally, met with a good deal of response from the trade.

In June of 1958 we struck a happier note. We spoke of the price stability which existed at that time between natural and synthetic rubber and we noted that this stability was a helpful thing for the rubber industry as a whole. The heat of Summer keyed our sentiments to a new high and in our July editorial we took strong issue with the United States Department of Commerce for its export policies. It seemed to us at that time as it seems to us today, that some Governmental agencies take actions which are frequently unwise in the light of current conditions. By August, we were feeling a little better about things and we devoted our editorial to a report of increased economic activity in the rubber industry. We pointed out that by getting on with the job at hand, we could all do much to increase the economic stability of our industry and the nation.

Two editorial matters occupied our attention in September. The first of these pointed to the fact that replacement tire sales in 1958 were likely to set a sales record for the seventh straight year. Year-end statistics, incidentally, have proved our prediction. The second editorial in this issue tried to point out some of the facts involved in our membership in the Audit Bureau of Circulations.

In October, we made reference to the recent campaign devoted to "Save Tires —Save Lives." We pointed out that fully 40 per cent of the people in the United States are driving about on unsafe tires. We also made certain recommendations to alleviate this situation. In November, we took a lighter approach, commenting upon the fact that many able young people are beginning to work within the rubber industry, assuring our future welfare.

It can be seen that our editorials throughout the year touched upon almost every facet of our life and activities in the rubber industry. We have tried to present our editorials in a manner which would both instruct and inform our audience.

Now, then, our December issue must have an editorial which states some point fairly and concisely. And so, we stand firmly and unequivocally for a Merry Christmas and a healthy, happy and prosperous New Year for all!

Special Industry Report

How Good an Executive Are You?

By LARSTON D. FARRAR

National Press Building, Washington 4, D. C.

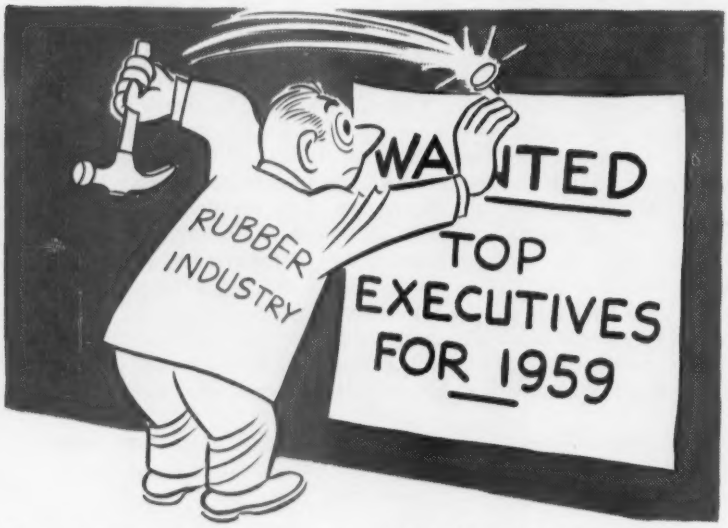
AS THE rubber industry heads again toward new production peaks, the shortage of executive talent in this industry of 265,000 employees in 952 cities in the United States again is coming to the fore in discussions in company after company.

Just as there was a continual scramble among top rubber companies for new men of executive caliber for some years, so it seems likely that, as the business challenges increase, this demand for new blood at the top will accentuate.

What is causing the executive shortage? The most obvious reason is that top men are dying, or retiring, in record numbers now. Many companies in the rubber industry—as in many another industry—have compulsory retirement rules. And even when retirement is not compulsory, many executives who are eligible to retire take quick advantage of their opportunities to do so, since they are financially able.

In the rubber industry, it is safe to say, thousands of men will be needed in 1959 to take the place of executives — in office and plant — who will be leaving, for one reason or another. The shortage of executive talent is *real*. There never has been a time when the old saying, "There's always room at the top," was more true than right now.

Even those executives who already are in top spots can review the qualities needed in an executive, for there always is a demand from stockholders and other officials for better executive talent. It would not hurt the rubber industry—or any industry— for its executives to give themselves the once-over occasionally to be sure they are living up to management's responsibilities.



Thousands of men will be needed in 1959 to take the places of executives who will leave the industry for one reason or another.

Who, What and Why?

What is an executive? There are many definitions. Elmer Frank Andrews once said: "If a man has an office with a desk on which there is a buzzer, and if he can press that buzzer and have somebody come dashing in response — then he's an executive!"

A business executive has been defined in many ways. One definition is that he is a man who can make quick decisions that are right — *sometimes*. Another is that an executive is a man who can do a good job of running a business, much against the predictions of people who knew him as a boy.

However he is defined, an executive is a person who can accept the responsibilities of operating an enterprise, whether it has one employee or a hundred thousand, and can successfully make it show a profit and either maintain or increase its usefulness as an organization in the business world.

W. L. Mackenzie King, late prime minister of Canada, said: "Labor can do nothing without capital, capital nothing without labor, and neither labor nor capital can do anything without the guiding genius of management; and management, however wise its genius may be, can do nothing without the privileges which the community affords."

Once you define an executive, you have to determine what qualities are desired in him (and remember, man embraces woman!). Ralph Waldo Emerson gave us a clue as to these qualities when he said: "Our chief want in life is somebody who shall make us do what we can. . . . " A good executive has the energy, the ambition, and the know-how to make people want to produce, and to buy his product at an economic price.

Emerson also said—and how true it is, even today!—that to forge ahead in business, you must "make yourself necessary to somebody." A good executive is necessary to a great many people, and to society itself. The Persian proverb put it a different way: "Luck is infatuated with the efficient."

The Executive Personality

Roughly, the characteristics on which principal management specialists agree as being those necessary in a top executive are these:

(1) The true executive is a person who understands the business in all its phases—his own company, its place in the industry in which it operates, and the industry's broad place in the world. He knows the company's principles, its principal problems, its past, and its potentials. Emerson also had something to say on this point: "Great men are they who see the spiritual is stronger than any material force; that thoughts rule the world." The highest executive must understand that what he learns, and what he thinks on the basis of that knowledge, ultimately determines the course of the whole business, and every man in it.

(2) The man who has the ability to make decisions—whether they are individually good or bad is immaterial—is able to step farther, and faster, than one who constantly is hedged in by doubts as to "what to do." The true executive type is the man who has ability to make decisions when there are sufficient data available, or, if it is not possible to get enough data, he has the courage to make a decision on the basis of the best available information and his own common sense and knowledge.

More of his decisions must be good than bad, of course, if the business is to succeed, but he learns early that making an occasional bad decision is better than continually procrastinating about what course to take. Once he has formulated a plan, and has made a decision, he has the courage and determination to carry it through, although unforeseen difficulties may come into view.

(3) The executive type of person has a spark of "divine discontent." He wants to make his company's products, or services, always better, and to see the company function more efficiently.

(4) The man who has the spark of executive talent is able to work well with people. This is because of many factors, each of which can be cultivated in any person who wants to cultivate them. First, he has a realistic picture of himself—both his advantages and his shortcomings.

Second, there is an underlying sincerity in everything he says and every service he renders. People cooperate better with a man, whether he is over them or under them in the chain of command, if they believe in his intrinsic honesty. Whether or not they agree with every opinion is another question, and not too important.

Third, he is able to think cooperatively. A good executive has opinions of his own, after he has thought problems through. Yet, he is mentally flexible enough to give way to the views of others on his staff, when he recognizes the worth of a suggestion, or a point, that he has not considered before. He learns how to think with people, not argue with them.

(5) A person who wants to be an executive must learn how to grow, rather than to swell. In modern business, there is no such thing as a sure thing, or a static situation. The wagon manufacturers who pooh-poohed the development of the automobile lived to see how short-sighted they were. Those who did not adjust—did not change over to making automobiles, or parts—were left out in the cold.

In a less dramatic fashion, *all* businesses are undergoing technological evolution all the time. In every business, enormous changes take place every day. A good executive must learn to read, to listen, and to understand the views and roles of others. Unless you want constantly to know more about the society, to understand the economy more and more, so that you might assay your company's position continually, you cannot hope to remain at the top of the heap, if you get there.

These are reasons why a good executive, to hold his post, must be dedicated to his job, and to his company. The American Management Association, in a national survey, found that company presidents spend about 80 to 90 hours a week in activities impinging directly upon their duties as executives. These presidents never really "get away," even on nominal vacations, for they figuratively are "wrapped up" in company affairs, and problems, all the time they are awake.

(6) A good executive must learn to work cooperatively. Many men of ability like to work alone. They are different, and their natural tendency is to act as they want to act. Yet to be a good executive, it is necessary to adjust to the working rhythm of the group, in order to inspire its members to get to work on time, to concentrate while on the job, or to put forth added effort when needed to get the job done.

(7) A good executive is a man who can exercise initiative. He is willing to consider new ideas, and to meet new people, more than halfway. In so exposing himself to new viewpoints, he gets new ideas that steadily help him to broaden his outlook.

(8) A good executive must learn to speak correctly and effectively so that when he does speak, he can be persuasive to others. A man with poor grammar—and a high degree of skill in his calling, or profession—may get by as an executive, but he will never be as good as he might be until he learns

Management personnel can rate themselves by seeing how many top executive characteristics they possess.

that many people, even his subordinates, judge him by his pronunciation of words, his ability to observe the rules of grammar, and his persuasiveness in speaking.

(9) A good executive must learn the amenities of life, and how to observe them. He must realize that he has to "get along" with the directors of the company, as well as with the newest raw recruit in the office. He understands that everything impinges upon everything else, and that if he is at cross-purposes with people in his company, his company will be at cross-purposes with society.

(10) A good executive must be determined. Even if he inherited the company, in effect, from his father or family, or even if he "married the right girl" to get his high post, he nevertheless must have a continuing desire to see the enterprise prosper and flourish. Literally everybody in the company takes his cue, in one way or another, from the top echelon of executives of an enterprise. If you are determined to be a good executive, then no one else can say, for sure, that you will not become one, for no one else has the ability to look into your heart and mind and to fathom the amount of determination that may be latent there.

Cato, the Elder, used to rise regularly in the Roman Senate to declare: "Carthage must be destroyed." Partly because of this constant reiteration by a respected man, the ancient city eventually was leveled. That was determination in action. If you will adopt your own slogan, will repeat it again and again, and will act on the slogan, you can whet your skills, and increase your capacity, to become an executive in any field on which your heart is set.

News Reports
and Industry Activities
RUBBER AGE, DECEMBER, 1958

RMA Holds 43rd Annual Meeting

► Approximately 200 members of the Rubber Manufacturers Association, Inc., attended the 43rd Annual Meeting held on November 20 at the Park Lane Hotel in New York City. Members elected two new directors and re-elected four for three-year terms. The new directors are: Fred B. Williamson, III, president of the Goodall Rubber Co., Trenton, N. J., and Russell DeYoung, president of the Goodyear Tire & Rubber Co., Akron, Ohio.

Re-elected were: A. L. Freedlander, chairman of the board of the Dayton Rubber Co., Dayton, Ohio; T. W. Miller, Jr., president of the Faultless Rubber Co., Ashland, Ohio; William O'Neil, president of the General Tire & Rubber Co., Akron, Ohio; and J. W. Keener, president of the B. F. Goodrich Co., Akron, Ohio.

The program for the meeting got under way with an address by Ross R. Ormsby, president of RMA, who spoke on "RMA Serving Industry." The speaker pointed out that development of tools to aid the industry in cost cutting and improving customer relations took on new importance as service functions of the organization during the 1957-58 business decline.

Major progress was achieved by the Traffic Committee, for example, in reducing transportation costs, President Ross R. Ormsby told 200 industry executives here today at the 43rd Annual RMA Meeting. During the year, the committee negotiated a seven per cent reduction in freight rates on carbon black from the Southwest, a 15 per cent reduction from eastern railroads on rates covering a wide range of rubber end products, and a reduction of $3.50 a ton on shipments of crude rubber from the Far East. The latter represents an annual savings to the industry of more than $1.5 million.

Rubber Shippers Association

In organizing and operating the new Rubber Shippers Association, the Traffic Committee opened to scores of companies an opportunity to further cut transportation costs, Mr. Ormsby said. Through RSA, shippers of less-than-car or less-than-truck-load lots can take advantage of the lower carload rates by consolidating merchandise for carload shipments. Savings amount to $10,000 on every million pounds of freight so shipped.

Mr. Ormsby called the industry's attention to the Crude Rubber Committee's findings that more than 40 per cent of the dry natural rubber imports by grade failed last year to conform to the quality specified in the buyer's contract. He urged all buyers to check the quality of imports against the standards established in the type sample books issued under this committee's direction to insure that they get the quality paid for.

In the field of customer relations, Mr. Ormsby cited the Tire Division's distribution of more than three million illustrated folders on tire care and safety, and its broad distribution to dealers of manuals covering the service aspects of tubed and tubeless tires and bulletins on the common causes of retread failures. In this connection, he noted the wide acceptance of a "Cooperative Educational Handbook" prepared for their customers by members of the Molded, Extruded, Lathe-cut and Chemically - blown Sponge Rubber Products Division.

Referring to one of the association's most basic functions, Mr. Ormsby described the tremendous increase in the volume of statistical information that is compiled for the industry. He mentioned the detailed report on production, shipment and inventory of tires—one of more than 400 reports and special surveys prepared annually by the RMA Statistical Department. This

Ormsby

Nygaard

Sears

Backman

83 page document has increased more than 1000 per cent since 1944.

Reviewed, also, were the extensive activities of the Manufacturing Committee in the field of industrial relations. In particular, he mentioned the inauguration of a series of regional meetings designed to aid the industry in improving the administration of incentive pay systems.

The success of these and other committee and divisional activities was credited by Mr. Ormsby in a large degree to the active participation of more than 600 industry executives in the day to day work of the association's 59 standing committees. He said that it is clear that the problems confronting the industry in 1959 in the varied fields of legislation, increased imports, collective bargaining and government regulation, as well as further efforts to keep costs down, emphasize the importance of full industry participation in the work of the association's committees.

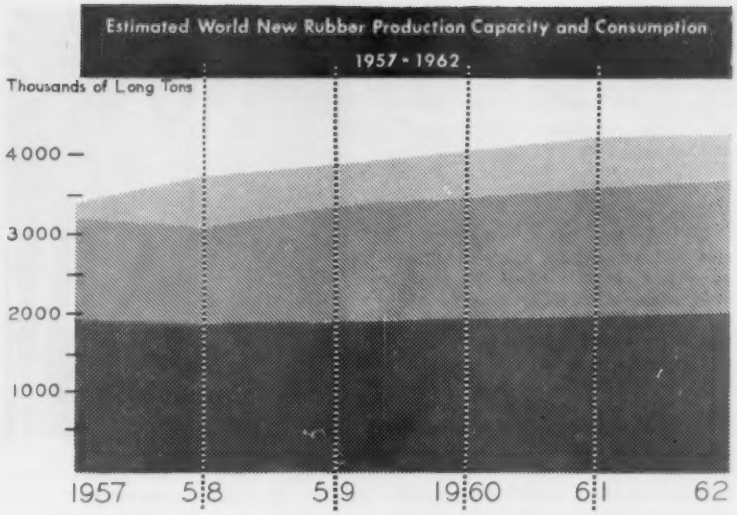
The next speaker on the program was Karl O. Nygaard of the Business Research Department of the B. F. Goodrich Co., who addressed the association as a representative of its Statistical Committee. Mr. Nygaard stated that a solid, 13 per cent gain in rubber consumption is seen for the rubber manufacturing industry in the United States in 1959.

He predicted that U.S. use of new rubber in 1959 would total 1,500,000 long tons. This compares with estimated 1958 consumption of 1,330,000 long tons and 1957 consumption of 1,464,640 long tons.

1959 Supply-Demand

Speaking on the "1959 Supply-Demand Outlook and Factors Underlying the Recession and Recovery in the Rubber Industry", Mr. Nygaard saw a bright picture ahead on the new rubber supply side of the equation. He said "rubber producers have announced expansions which will boost natural and synthetic rubber capacity from 3.4 million long tons in 1957 to an estimated 4,364,000 long tons by 1962—an increase of about 25 per cent in five years." He said over 200,000 long tons of new rubber capacity was added in 1958 alone.

He commended governments and private producers in Malaya, Liberia and certain other nations on real progress that is being made in building a sound foundation for expanding natural rubber production in the future. But for the short term, Mr. Nygaard said, "Synthetic rubber will account for virtually all of the increase in world new rubber supplies over the next several years. He pointed both to a 50 per cent increase in U.S. capacity in the past two years and the fact that an estimated 225,000 long tons of synthetic rubber will be produced in free nations outside the United States this year. He said that



in 1958 total new rubber capacity exceeded world demand by roughly 660,000 long tons and that the committee expects this margin to be maintained at least through 1962.

Mr. Nygaard said synthetic rubber is accounting for an ever increasing share of total new rubber requirements in both the United States and other nations of the free world. "Of total new USA rubber consumption this year, 64.3 per cent will be synthetic. . . . In other free nations," he said, "the rising trend in synthetic rubber consumption has continued almost without interruption since the end of World War II", and is presently equivalent to more than 25 per cent of their total new rubber requirements.

With regard to the complex factors underlying 1958 recession and recovery in the industry, Mr. Nygaard said that recovery in the industry since April has been just as rapid as was the decline prior to April.

Noting that in general, consumer type rubber products fared well in 1958, he said, the principal impact of the 1958 recession was felt by the original equipment manufacturers of automotive products and manufacturers of industrial rubber products.

For example, Mr. Nygaard reported that "Industry shipments of replacement passenger car tires will total an estimated 59.5 million units in 1958, (a new record) and a healthy five per cent gain over shipments last year." Although industry shipments of replacement truck-bus tires were quite weak in the first half of 1958, he estimated that total shipments this year would reach 8.8 million units, a gain of 3.3 per cent over 1957. He forecast a 13.8 per cent gain over 1957 in shipments of replacement farm tires.

"All of these increases in replacement tire sales have provided a partial but important offset to the decline in original equipment business. The estimate for total industry shipments of pneumatic tires this year," Mr. Nygaard said, "is over 101 million units, seven per cent under 1957."

With regard to shipments of other products he said rubber footwear shipments will show a small gain over 1957 and that major drug sundries though down from last year will come close to matching 1957 performance.

Mr. Nygaard said that "Despite lower production volume and reduced employment opportunities this year, hourly earnings of rubber production workers have increased substantially. There has also been some broadening in the supplemental employment benefits." He said, in September average hourly earnings for rubber production workers reached $2.38, not including supplemental employment benefits of more than 65c an hour.

1958 Profits Decline

The speaker cited FTC and SEC figures showing the industry's profits after taxes in the first six months of 1958 were 29 per cent below the total in the last half of 1957, while dollar sales in the same period declined only nine per cent. For that period, he said, "profit margins in the rubber industry, whether measured as a per cent of sales or return on capital, fell well below the average for all manufacturing industry."

W. J. Sears, vice-president of the RMA, for his part in the program, addressed the group on "The 1959 legislative Outlook." Pointing to Labor's sweeping gains, Mr. Sears said that the clear lesson of the November elections is that management must accept the challenge to organize and utilize its political resources if it is to preserve an economic climate that will permit growth and progress.

Mr. Sears recited the claim of the AFL-CIO Committee on Political Education that it had seated 70 per cent of its endorsed candidates over-all. "Traditionally, the American business community has been too preoccupied with creating and producing things and improving everyone's standard of living to become actively concerned with politics."

Mr. Sears said that management must realize that there are many conditions apart from the forces of the market place which affect its freedom of decision in doing business. Political, economic and even social forces influence the business climate. He said these forces, tangible and intangible, operate at all levels, and that they can be as concrete as taxes or as nebulous as the general attitude of the community toward its business neighbors.

"The net result of all these outside conditions has been described as the business climate. The business climate will continue to suffer unless businessmen as individuals take a more active part in political affairs at local, state and national levels.

"It is inconceivable to me, as it must be to all of you," Mr. Sears said, "that the majority of the American public is as anti-business as the representatives they send to Washington and the state capitols" . . . since, "certainly the American people would not vote for government ownership of industry and business.

"It seems obvious," he said on this point, "that American industry has failed to sell the voters on the self-evident truth that the opportunity to make a profit is everybody's business—whether it be through wages, salaries, dividends, interest or investment."

Cites Coming Legislation

Mr. Sears urged industry to concern itself with foreseeable problem areas in the legislative fields of taxation, federal spending, labor and business regulation during the forthcoming session of the 86th Congress; pointing out that there are pending "certain legislative proposals, which, if they became law, would increase the costs and burdens of doing business. They would require you, as businessmen," he warned, "to do things contrary to your interests or prevent you from continuing certain practices that are sound and profitable in both your own and the public interest. In the final analysis, it is the consumer who will bear the burden of these additional costs imposed upon industry."

Dr. Jules Backman, professor of economics at New York University, concluded the morning program with a talk on "1959 Outlook for Business and Collective Bargaining." Business recovery will continue in the months ahead, he declared. "Higher personal incomes, greater government spending, and the shift from inventory liquidation to inventory accumulation will exercise powerful forces for expansion. However, new plant and equipment spending is not expected to record a significant upsurge such as that which was so influential in the 1955-57 period. The main negative factor today is the tighter credit policy of the Federal Reserve System."

John A. Stephens
addressed luncheon session

Dr. Backman pointed out that "The 1957-58 decline was due in considerable measure to the shift in inventories from an annual rate of accumulation of $2.2 billion in the third quarter of 1957 to a $9.5 billion rate of liquidation in the first quarter of 1958. This swing of $11.7 billion accounted for about three-fifths of the decline in gross national product.

"As the rate of inventory liquidation was reduced starting last spring, it helped to trigger the recovery. One of the factors which kept the decline from growing much deeper was the fact that personal incomes did not decline very much—from $351.8 billion at the peak last year to a $347.3 billion rate in the first quarter of 1958. This was a decline of slightly more than one per cent. Personal income has now increased to a new high level of close to $360 billion. As a result we face the biggest volume of Christmas spending in our history."

The NYU professor was optimistic concerning the outlook for automobile sales. "The 1958 decline in auto sales reflected the uncertainty and unemployment which characterize a recession. The fact that the wartime defined demand had been fully supplied meant that the postponement of buying, which is a typical recession phenomenon, played an important role in the 1958 decline in auto sales.

"The business recovery means more jobs and better jobs. In turn, this will lead to an expanding demand for automobiles. Currently, automobile purchases account for only about 3% of consumer income as compared with a normal ratio of above 4%. With recovery, consumers will spend more freely and automobile sales should once again rise above the 5 million mark." This will have a favorable impact on sales of rubber companies, he stated.

Dr. Backman stated he expected only modest changes in consumer prices in the months ahead. "Large supplies of farm products are anticipated and this situation usually is accompanied by easing food prices. However, prices of services will continue to inch forward. On balance, the level of consumer prices should record only nominal changes despite the widespread fears of a significant inflation. The threat of inflation has been considerably exaggerated in recent weeks. Recovery will mean higher tax yields to the Federal government so that the size of the budget deficit—the most inflationary factor in our economy today—should be reduced significantly.

"One of the dark spots in the business outlook is the probability that the level of unemployment will decline very slowly," Dr. Backman stated. "Each year we add 600,000 or more to the labor force while increasing productivity may reduce by 1,000,000 or more the number of workers required to turn out the same output. Thus, only as we achieve a breakthrough to new high levels of output can we solve the problem of unemployment."

Economic Environment

Professor Backman pointed out that "The economic environment for wage negotiations in 1959 should differ from that in 1958 in several respects: business will be recovering instead of receding, profits will be rising instead of falling, and output per man hour will be increasing somewhat more rapidly. The economic environment should be similar in regard to prices and wage patterns although it is possible that the consumer price index will show only unimportant changes. Rising output per man hour combined with somewhat smaller increases in total labor costs would make it possible to limit wage inflation for the first time in several years. If that goal can be achieved it will be most helpful to all groups in the economy including the workers themselves."

Following Professor Backman's talk a reception was held preceding luncheon. Following the luncheon, John A. Stephens, president of the United States Steel Corp., delivered an address on "Impressions of the Soviet Union." Mr. Stephens served as Deputy Chief of the 19-man American Steel and Iron Ore Mining Industries delegation which inspected major steel plants, mines and mining equipment factories and metallurgical centers in the Soviet Union between May 21 and June 21 of this year.

SAE-ASTM Technical Committee Reports

► January 1, 1959 is the target date for completion of the proposed expanded tabular system for a master rubber specification by appropriate bodies of the Society of Automotive Engineers and the American Society for Testing Materials. The proposal combines existing SAE 10R and ASTM D-735 tables into a single specification which is to consist of two tables; one of all current basic tables, and the other of all current suffix tables. The new system which is being coordinated with the Defense Department's rubber specification program offers a more flexible way to incorporate new polymers and polymer blends. Upon completion of the proposed table, an effort will be made to fit both solid and cellular rubber compositions into the new system.

On the subject of fluid aging, the validity of ASTM Method D-471 (Changes in Properties of Rubber and Rubber-Like Materials in Liquids) has been re-established. Members blame improper application of this method for the reported discrepancies in test results. Plans are being made to immerse Viton A and various polyacrylate compounds in five gear lubricants for 70 hours at 300°F. Results of this and other time-temperature immersion studies will be reported at TCAR's meeting in December, 1958.

The practicality of shortening the current test time for compression set from 70 hours to 22 hours is under final ballot. The new compression test time will apply to Classes SB and SC for both basic and suffix B requirements. TCAR work has revealed that the 22 hour at 212°F. test gives compression set results that are approximately two-thirds of the values given by the present 70 hour test.

Testing Program Under Way

Round-robin testing of approximately 12 rubber compounds is under way to determine the adhesive qualities of vulcanized rubber to metal. Tear tests are being conducted on mats made to SAE 705 staining, SAE 705 non-staining and SAE 709. Conditioning will be for six hours at 158°F. The mats will be tested with and across grain. An ozone exposure test procedure is being finalized since nine laboratories reported substantial agreement on tests of two neoprene compounds exposed for 24, 48 and 72 hours at 100°F. Neoprene latex film tables have been established. Eventually they will be expanded to include natural rubber and nitrile latex films.

► Two new data sheets on dimethyl acetamide and allyl esters have been released by the Monomer-Polymer Laboratories of the Borden Chemical Co., Philadelphia, Penna.

South Haven Completes Addition

► South Haven Rubber Co., South Haven, Mich., has recently completed an addition to its plant, which added 20,000 square feet of floor space directly to the east of its main building. South Haven commenced operations in 1956, manufacturing custom molded items for automotive and industrial uses. In the fall of 1957, the need for increasing the capacity of the plant developed, and construction work began. The company installed additional mixing, curing and finishing facilities in the new addition.

At South Haven's annual meeting the following personnel were re-elected as officers and members of the board of directors: *President*, C. R. Spencer; *Vice-President*, George D. McCarthy; *Vice-President*, C. H. Skuza; *Secretary*, A. B. Vidmar; *Treasurer*, J. H. Nieberding.

Develops Two New Compounds

► Precision Rubber Products Corp., Dayton, Ohio, has developed Compounds "17007" and "17107", which are said to increase the service temperature range of O-rings and other seals far beyond that achieved previously. Precision Compound 17007 was developed to fill special needs in all branches of industry and Military Services. The service temperature range is—45°F. to +500°F. and may be extended to a temperature beyond the service conditions. Compound 17107 was developed to meet the most severe Military Service requirements for resilient elastomers. The materials have exceptionally low compression set at high temperatures, low volume change, and resistance to a wide variety of destructive chemicals and fuels, synthetic lubricants and hydraulic fluids, according to Precision Rubber.

Government Motion Denied

► A Government motion for a temporary injunction against E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., and General Motors Corp., Detroit, Mich., was overruled by Federal Judge Walter J. Labuy, of the U. S. District Court. The judge declined to render what he termed a piece-meal determination of the case as final hearings are scheduled for January 26, 1959. The purpose of the Government's motion, which was requested by the Antitrust Division of the Department of Justice, was to bar stockholders of DuPont and General Motors from becoming officers in each other's corporate organizations, and to restrain DuPont from obtaining additional General Motors stock.

Enjay Appoints Hebert

► G. M. Hebert has been named manager of a newly-created Export Sales Division for Enjay Co., Inc., New York, N. Y., which will consolidate the export, worldwide, of all Enjay products including butyl rubber and other polymers, chemicals and petroleum additives. Prior to his new appointment, Mr. Hebert served as Enjay's sales manager for Paramins. He began his career in 1938, after graduation from the University of Illinois, as a petroleum engineer for the Carter Oil Co. In 1946, he joined Esso Research and Engineering Co. as a lubrication engineer and three years later, he transferred to Enjay as a technical representative, coordinating technical service. Mr. Hebert was named sales supervisor of technical representatives in 1953, advancing within a year to assistant sales manager for Paramins, both domestic and export. In 1956, he became sales manager for that division. During World War II, Mr. Hebert served as a Lieutenant Commander in the Navy, assigned to flight test work at MIT and the Naval Test Center, Patuxent River, Md.

Schulman Opens Branch Office

► A. Schulman Inc., Akron, Ohio, has announced the opening of a new branch office at 2947-51 West Touhy Avenue, Chicago, Ill. The firm's main office and plant are at Akron, Ohio, with branch offices at New York City, Boston, East St. Louis and Los Angeles. James Steiner, assistant sales manager of the firm's New York office, has been appointed sales manager of the new Chicago branch.

Alvin N. Gray

Retires From Western Electric

► Alvin N. Gray, who has been associated with the Bell Telephone Laboratories and the Western Electric Co. for 36 years, has retired as head of development engineering at Western Electric. Mr. Gray, the first man in Western Electric service to receive the James H. McGraw Award for Electrical Men, has devoted his entire career to the manufacturing problems involved in rubber and plastic insulated wire and cable and the continuous electrodeposition of metals on wire. He now plans to work on special arrangement and will undertake his first project on this basis in Japan.

A 1922 graduate of the University of Virginia with a degree in chemical engineering, Mr. Gray began his career in the Bell System at the West Street, New York City, engineering organization. He was transferred to the Bell Telephone Laboratories in 1925 and in 1930, he joined the Western Electric Point Breeze Works in Baltimore, Md., as a chemical engineer. Later, Mr. Gray was promoted to department chief and became assistant superintendent of the Rubber Covered Wire Shop in 1942. In 1946, he was named assistant superintendent of chemical and physical processes and since that time, he has worked on the development of rubber covered wire and the electroforming process.

Until his retirement, Mr. Gray was the Point Breeze representative in the American Society for Testing Materials. He is the holder of 35 patents, 27 of which are in his name, and he has eight patents pending.

Atlas Powder Names Quinlan

► Arthur F. Quinlan has been named assistant regional manager of the Chicago chemical sales office, by Atlas Powder Co., Wilmington, Del. Mr. Quinlan joined Atlas shortly after receiving his B.A. degree in chemistry from Lafayette College in 1950.

Four Research Appointments

► Research Division of the newly organized Development Department of Petroleum Chemicals, Inc., New Orleans, La., has announced four new appointments including Dr. Robert L. Hellwig as head of the engineering section; Dr. John W. Sellers as head of the organic section; Robert S. Munger as group leader of the analytical section, and Dr. Richard Seekircher as group leader of the chemical section. Dr. Hellwig received his chemical engineering training at the University of Texas. Before joining P. C. I., he served as a chemical engineer for E. I. du Pont de Nemours & Co., Inc. at Orange, Texas, and as a process engineer for the Ethyl Corp. at Baton Rouge.

Dr. Sellers received his doctorate at Ohio State University after completing undergraduate training at the University of Illinois. Previously, he was a chemical engineer and later a research chemist with the Firestone Tire and Rubber Co. Prior to joining P. C. I., he was a research group leader for Columbia Southern Chemical at Barberton, Ohio. Mr. Munger holds a master's degree from Oklahoma A. and M. He was formerly affiliated with the Research Department of Continental Oil Co. and occupied a post as senior research chemist with that company. Dr. Seekircher received his doctor's degree at Technisches Hockscule, Karlsruhe, Germany. He was formerly associated with the Edeleanu Co., Frankfurt, Germany, as a research chemist and later with the British-American Oil Co., Toronto, Ont.

Quick Setting Silicone Rubber

► Dow Corning Corp., Midland, Mich., has developed a quick setting silicone rubber, called "Silastic RTV 502". This new material is reported to be an easy-to-apply liquid which vulcanizes to a rubber in only 30 minutes. According to Dow Corning, Silastic RTV 502 is suitable for sealing and caulking metal - to - metal and metal - to - rubber joints; patting and encapsulating electrical and electronic parts; as a mold or impression material for making prototype parts; and as a shock and vibration absorber for delicate components.

Atlas Enters Urethane Field

► Atlas Powder Co., Wilmington, Del., has entered the polyurethane supply field with its polyethers for rigid foam application: propylene oxide-sorbitol adducts. The company's polyether has six functional OH groups in the molecule, and a molecular weight of 760. According to Atlas, 1958 urethane foam output was near 50 million pounds with about 10 per cent being rigid. The company states that the new product can reduce manufacturing costs by as much as 25 per cent.

F. K. Schoenfeld

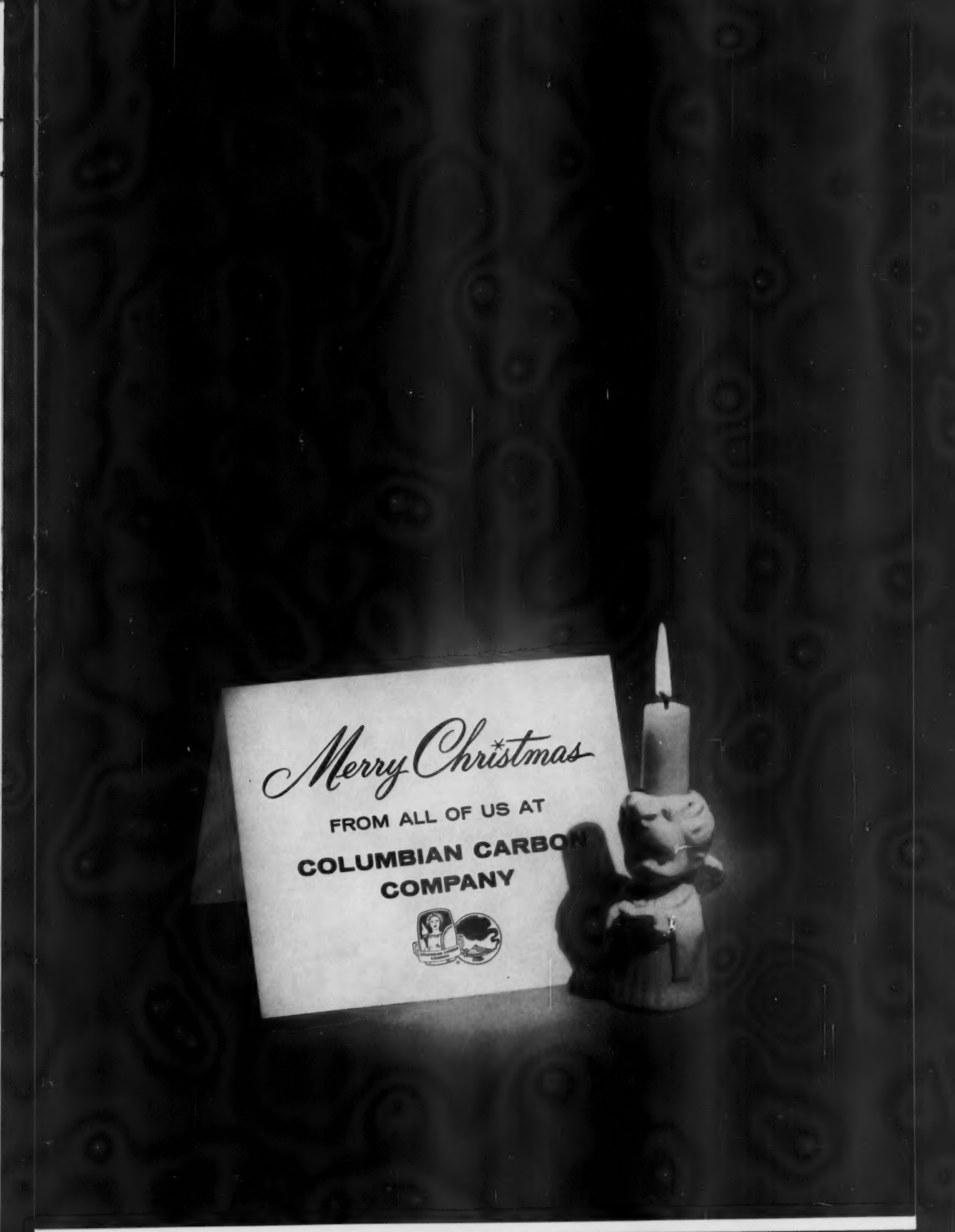
Named To Receive IRI Medal

► Dr. Frank K. Schoenfeld, vice-president, research, for the B. F. Goodrich Co., Akron, Ohio, has been named the recipient of the 1959 Industrial Research Institute Medal for "outstanding accomplishment in leadership or management of industrial research which contributes broadly to the development of industry or the public welfare." The presentation will take place in May, 1959, at the annual meeting of the Industrial Research Institute.

Dr. Schoenfeld joined Goodrich in 1927 and has been vice-president, research, since January, 1954. His early work as a research chemist on vinyl resins led to his appointment as manager of Koroseal research and development in 1939. When B. F. Goodrich Chemical Co., a division, was formed in 1943, Dr. Schoenfeld was appointed its technical superintendent, becoming technical vice-president in 1946. During World War II, he was responsible for all technical operations of three synthetic rubber plants, built and operated by Goodrich for the government. In his present capacity, Dr. Schoenfeld is responsible for all of the fundamental research of Goodrich and for corporate new products and development.

Form Advisory Firm

► Harry Bennett and Edward Rosendahl, for the past 30 years president and executive vice-president, respectively, of Glyco Products Co., Inc., have sold their interests in that company and have opened new offices at 10 Columbus Circle, New York, N. Y., under the name of Bennett-Rosendahl Co., Inc. They will act as advisors to small and medium sized chemical companies in all business matters, connected with the running of a chemical company. Included in their service will be advice on organizing and handling sales, purchasing and plant safety departments; publicity; catalogues; personnel problems; foreign agencies; public and private financing; and preparing companies for sale or merger.


Merry Christmas
FROM ALL OF US AT
COLUMBIAN CARBON
COMPANY

Helping Dreamers to Dream Keeps America Strong

"We are the music-makers,
And we are the dreamers of dreams . . .
Yet we are the movers and shakers
of the world forever, it seems."

Arthur O'Shaughnessy, The Music-Makers

Throughout our history as a nation—indeed, throughout the history of all mankind—it has been the dreamers of better ways of doing things who have made our lives more worthwhile.

And yet the dreamer of today, if he is to contribute to the betterment of his fellow man, must be an *educated* dreamer. He must have assimilated the knowledge and undergone the training that enable him to dream *beyond* the present, beyond the knowledge we have now.

Can there possibly be a better reason for strengthening the *sources* of knowledge—colleges and universities?

It seeems incredible that a society such as ours which has profited so vastly from an accumulation of knowledge—and from the fulfillment of dreams—should allow anything to threaten these wellsprings of our learning.

The crisis that confronts our colleges threatens to weaken seriously their ability to transmit the knowledge and to encourage the dreams that will keep America strong.

The crisis is composed of several elements: a salary scale that is driving away from teaching the kind of person *best qualified* to teach; overcrowded classrooms; and mounting college applications that will *double* in less than ten years.

Help the colleges and universities of your choice. Help them plan for stronger, better-paid faculties and for expansion. The returns will be greater than you think.

If you want to know more about what the college crisis means to you, and what you can do to help, write for a free booklet to: HIGHER EDUCATION, Box 36, Times Square Station, New York 36, N.Y.

Sponsored as a public service in co-operation with the Council for Financial Aid to Education, by

COLUMBIAN CARBON COMPANY

380 Madison Avenue, New York 17, N. Y.

HIGHER EDUCATION
KEEP IT BRIGHT

PUBLIC SERVICE ADVERTISING COUNCIL

Fabrics for Coating Subject of QMC Conference Held in October

► More than 250 industry representatives attended the Conference on Military Applications of Fabrics for Coating, sponsored by the Textile Fabrics Committee of the Quartermaster Advistory Board for the National Research Council of the National Academy of Sciences, and held at the Quartermaster Research and Engineering Center, Natick, Mass., on October 16 and 17.

Consisting of four technical sessions, the conference was opened with introductory remarks by W. George Parks, executive director for the Advisory Board on Quartermaster Research and Development; Col. Hoke Wofford, deputy commander for the Quartermaster Research and Engineering Command, and Dr. Stanley Backer, chairman of the Subcommittee on Textile Fabrics.

The first technical session, chaired by Dr. Backer, began with a discussion of "Military Applications for Coated Fabrics." Dr. Stephen J. Kennedy (Quartermaster Research and Engineering) presented the United States Army outlook in a paper entitled "Army Applications of Fabrics." In this paper, Dr. Kennedy reviewed the role of textiles for coating in military applications. He went back to World War II, and described the types of coated textiles then used in military items; the studies which were made at that time in this field; the changes in the use-requirements since then, and the effect of these changes upon required fabric properties. He grouped the various uses for coated fabrics into four general classes: clothing uses; small lightweight tents and covers; frame supported tents, paulins and covers; and specialty uses such as coated fabrics for air bags and water containers.

Potential Applications

After discussing progress made to date in these areas, Dr. Kennedy went on to speak about the future potential applications of coated fabrics in army use. He said that the field for application of coated fabrics in Army requirements is growing and undoubtedly will expand in the future due to the inherent advantages of lightness in weight combined with high strength which this type of fabric provides. He felt that in the continual effort to bring down weight and bulkiness of military equipment, emphasis would continue to be placed on increasing still further the strength of the synthetic fibers themselves in order to permit lightening of weight and reduction of the amount of coating used. He closed his talk by enumerating some of the possible approaches to this goal.

The next paper "Naval Applications for Coated Fabrics", was presented by Robert Grubb (Philadelphia Naval Shipyard). Mr. Grubb discussed some of the problems with which the Bureau of Ships is confronted in this area, stating that the Navy is concerned with the development of lightweight coated materials for topside use and a lighter more durable group of coated materials for fabrication into lifesaving materials. He enumerated some of the ways in which the Navy utilizes coated fabrics, giving the properties and characteristics of those in current use.

Cites Disadvantages

Mr. Grubb described some of the disadvantages of impregnated canvas, such as its weight, crockiness, difficulty in shedding ice, and its relatively dull, unattractive appearance. However, he said, even with these known defects, treated canvas has performed well and suitable canvas substitutes should possess all of the essentially good properties of treated canvas. They should also eliminate some or all of its undesirable features without adding any new objectionable properties and should remain competitive cost-wise. He stressed that by cost-wise, he referred specifically to the cost-durability relationship.

Some of the materials that the Navy is currently testing were described with a listing of their advantages and some of their drawbacks. Mr. Grubb felt that the successful maintenance of the United States Fleet as the efficient operational force that it is today, depends to a great extent on the continued support of industry in solving the problems described as they arise.

J. H. Ross (Wright Air Development Center) concluded the discussion of "Military Applications for Coated Fabrics" with a talk on the Air Force point of view in a paper entitled "The Role of Coated Fabrics in Today's Air Force." Mr. Ross listed some of the more important areas where coated fabrics play or should play an increasingly important role and went on to enumerate some of the more important requirements for specific coated fabrics and those that exist for a general category of end items.

Mr. Ross then listed some requirements for coated fabrics. He said that base fibers should have temperature resistance above that of nylon and Dacron; a lower specific gravity as well as the strength of present nylon; and greater ultra-violet light resistance. Requirements for elastomers or plastics, he said, are high temperature resistance and greater density to prevent heat diffusion to base fabrics.

Specific requirements listed were for coating materials able to resist HEF type fuels and having impermeability for 24 hours because of the toxic nature of the fuel. These fibers should also be able to withstand 500°F. while retaining 50+ per cent strength for use in thermal curtains and hot air ducts. Elastomers or plastics that will withstand temperatures of 700°F. are needed for coating on a high temperature fiber. For thermal and accoustical blankets, low cost, high strength fibers and coatings are needed to maintain an over-all low weight installation, according to Mr. Ross.

He pointed out that in most cases, the Air Force development budget precludes projects on coated fabrics other than in clothing items. "We in the Air Force," he said, "appreciate the time, materials and effort spent by the coated fabrics industry in the preparation of experimental elastomers and plastics applied to various fabric constructions."

The next paper, entitled "Design for Climatic Extremes", was delivered by Dr. Austin Henschel (Quartermaster Research and Engineering Center). Mr. Henschel said that two problems of military applications in fabrics for coating are the extremes of climatic environment in which the fabrics may be used or stored, and the physiological problems of maintenance of body heat balance for the person wearing coated fabrics. He stated that any fabric, coated or non-coated, placed on the skin of a man forms a barrier to the free exchange of heat and moisture between the man and the environment.

Climatic Factors

The extremes of climatic factors to which coated fabrics and other material might be exposed during use or storage were listed including temperature, humidity, rainfall, wind, atmospheric pressure, blowing snow, sand and dust, and snowload. For practical purposes, he said, more important than absolute extremes of climatic factors is the duration and frequency of occurrence. Data on a world-wide basis are now being analyzed with this in view, particularly for low temperatures. Derivation of frequency of occurrence of high temper-

atures for some of the "hot" regions of the world is also underway. According to Mr. Henschel, when these data become available, they will provide a more functionally realistic basis for setting environmental design criteria.

"Interaction of Fabric Structure and Coating Type as Affecting Performance", by Dr. Milton M. Platt (Fabric Research Laboratories) was the final paper of the first technical session. Dr. Platt said that although a great deal is known about performance of uncoated textile fabrics, specific information on how fabrics of various fiber contents and geometries interact with coatings of various properties is not known. He explained that an extremely minor amount of research has been performed on this subject. Discussing tear resistance, he illustrated the influences of fiber properties and fabric structure of the mechanical behavior of the fabric. He also described the variables in an uncoated fabric that can affect its tear performance, and the effects of various finishing treatments of fabric distortability.

Dr. Platt cited the considerable range of results achieved in some research studies made at Fabric Research Laboratories for the Office of the Quartermaster General on the relationship between plasticizer content of coating and tear strength. He then presented data on the effects of the modulus of elasticity of coating—its ability to distort, the location of coating, aging, degree of penetrations, etc., on the mechanical properties in tear of coated fabrics.

Fabric-Coating Interaction

Dr. Platt closed his talk with a discussion of future work which must be done in order to answer the question "How do fabrics and coatings interact?" He also delineated qualitative mechanisms involved in the reaction of uncoated fabrics to a selected externally applied stress, namely tear; the influence of fiber properties and fabric structure on response to this type of stress; and the inferences as to how coatings could influence this "natural" response. He felt that the above might serve to set some of the goals of future research in the field of coated fabrics.

The second technical session, which was also presided over by Dr. Backer, was opened with a paper by W. Corry (Landers Corp.) on "Fabrics for Coating: Design and Construction." Mr. Corry reviewed some of the means available for the design of fabrics, some of the gaps in current knowledge which handicap efforts, and some factors which are peculiar to fabrics for coating. He listed important characteristics to be considered in the design of a coating fabric, including breaking strength, weight, cost, tear and fabric tightness and bulk. Each of these was analyzed at length.

Mr. Corry pointed out that other important and practical factors to be considered were those which produce knots and slubs in fabrics, which can make a surface defect thicker than the coating itself, in many cases. Also important, he said, is any factor which produces tight selveges or bagginess in the goods. These would cause the fabrics to be troublesome in fabrication. Mr. Corry warned that the benefits of an otherwise good fabric design could be completely obviated if the coating surface were irregular or unstable.

"New Fibers and Fabrics for Coating," was presented by Rexford C. Pike (DuPont). In this paper, Mr. Pike said that many fibers may be used as reinforcing membranes by the coating industry and he discussed four such fibers and a new fabric principle. The first was a modification to the existing nylon, identified as "Type 105, 205 or 305." The second was a standard fabric, but new to the coating business, "Type 51 Dacron." Also named were hot-stretched, heat-set "Type 51 Dacron", and a yarn "Teflon TFE", fluorocarbon fiber. The new principle concerned the use of synthetic fiber papers for coated products.

Mr. Pike's discussion of each of these included properties, applications and their suitability for coating. He stated that the new fiber products discussed, including synthetic fiber papers, are excellent candidates as substrate materials for coated fabrics.

Cites Coating Advances

Dr. George R. Thomas presided over the third technical session, which began at 9:30 A. M. on October 17. The first paper, entitled "Technical Advances in Coating Materials for Fabrics," was presented by F. H. Fritz (DuPont). According to Mr. Fritz, coated fabrics are generally employed either to contain gases or to protect other materials from the elements or other deteriorating influences. While the fabric is the strength member, he said, the coating protects the fabric from deterioration and, properly chosen, provides an impermeable barrier which resists the penetration of fluids.

Mr. Fritz discussed advances made in rubber and plastics coatings during the past twenty-five years, together with new materials and methods of fabrication for the coated fabrics industry. Some of the major technical requirements for military coating materials on coating fabrics were listed and then Mr. Fritz went on to discuss polymers in major commercial use. Major factors influencing the choice of coating materials, he said, are fabric protection; fungus and mildew resistance; low temperature serviceability; flame resistance, and gas permeability. He discussed each of these in relation to the types of coating materials now available and explained how these materials perform in tests.

Chlorosulfonated polyethylene (Hypalon); Urethane polymers; and specialty heat and fluid resistant polymers, such as Viton, all new polymers which have been developed to meet increasingly complex technical requirements, were described. In closing, Mr. Fritz, discussed future construction methods and described three chemical classes typifying the thermoplastics (other than PVC) which show considerable promise. These were polyethylene films, transparent nylon films and transparent polyethylene terephthalate (Mylar) films.

Coater Problems Noted

Joseph Haas (Hodgman Rubber) presented "Technical Problems of the the Coater." In this paper, Mr. Haas gave a brief survey of commercial coating techniques to meet end use requirements; formulation of coatings; fabric selection to meet end use requirements and case studies of the whole problem; and formulation-fabric design-coating techniques. He discussed knife coaters and calenders, and the way each of these operates, and then went on to discuss coating materials and base fabrics, giving the historical background of their development.

Mr. Haas presented a case history of the type of problem that faces the coating technician and the manner in which it is tackled and finally solved. He discussed desired improvements in the present vinyl resin-nylon poncho material, giving the nature of the fabric required, the proper coating and the methods utilized to obtain the desired result.

"Evaluation of End Item Performance," by K. L. Keene (U. S. Rubber) was the final paper at this session. Mr. Keene's discussion of the evaluation of end point performance covered purpose; information needed for writing a specification; product service tests; review of some present test methods; new test methods; and the value of investigating actual service conditions.

Rubber Literature List

► The Library Association, Chaucer House, Malet Place, London, W.C. 1, England, has compiled a special subject listing of rubber literature. The listing contains bibliographies and guides to sources of information about rubber—natural and synthetic; abstracts; rubber libraries and information centers; historical literature; rubber economics; encyclopaedia; periodicals; directories; rubber technology; compounding and rubber chemicals; engineering and other uses and applications; processing and equipment; reclaim and processing aids; rubber planting; testing and aging; and vulcanization.

Mr. Keene described several of the many coated fabric test methods which are available to the evaluator of a coated fabric. He advised that in the choice of coated materials, manufacturers should use service tests or consumer used material wherever possible, to determine the suitability of a coated fabric for its intended use. All physical tests should be based on: a study of the properties necessary to produce a satisfactory end product; a study of the tests which will simulate the actual service conditions; and a study of the reproducibility of the test method in various laboratories. Manufacturers should make sure that all pertinent tests have been included in the specification and should also eliminate any test which does not have a bearing on the serviceability of the product or cannot be duplicated in another laboratory.

The final session consisted of a panel with Dr. Stanley Backer presiding. The first speaker was L. L. Shailer, Jr. (Goodrich). Mr. Shailer discussed desirable properties in coatings such as fungus resistance, gas permeability and moisture vapor transmission. He also described some materials which yield desired results on these two scores.

PVC Fungus Resistance

Polyvinyl chloride, he said, has outstanding fungus resistance and the properties of gas permeability and moisture vapor transmission are greatly influenced by the compounding additives used to adjust the processing and general performance characteristics. Nitrile rubbers yield exceptionally low gas permeability properties and high acrylonitrile content polymers such as Hycar 1001 yield gas permeability values equivalent to butyl rubber, it was pointed out. Mr. Shailer also described some new coating materials including Hycar 4021; Hycar 1072; and Estane VC.

S. R. Shuart (Enjay), who also participated in the panel discussion, spoke on the topic of "Butyl Rubber in Proofed Goods Applications." According to Mr. Shuart, butyl rubber is employed in the proofing industry for a wide variety of applications, some of which are automotive convertible tops; portable swimming pools; rubberized upholstery fabric; flexible pipe for irrigation purposes; canal liners for irrigation purposes; chemical resistant clothing; rainwear; and air mattresses. Properties that account for the use of butyl rubber in these applications are ozone and weathering resistance; abrasion and flex resistance; impermeability to gases, electrical resistance; heat resistance; chemical resistance; tear resistance; non-staining and non-discoloring properties; and cost.

Of great significance to the proofing industry, Mr. Shuart said, has been the development of a butyl latex that can be employed to achieve high levels of adhesion to fabrics such as nylon and rayon. He mentioned another new polymer which may have interest in the proofing industry, which is known as "Md 551." This is a halogen containing polymer which has very high heat resistance, greater ozone resistance, chemical resistance, and the ability to cure somewhat faster than the commercially available butyl rubbers. In addition, he believed, it will enable the use of a variety of cure systems including non-toxic systems and it will produce better adhesion and afford a greater degree of compatibility with highly unsaturated polymers.

Wood

Nelson

Rose

Green

Enjay Elects Four Executives

► Enjay Co., Inc., New York, N. Y., has announced the election of a new president and three new vice-presidents. John E. Wood, III, is the company's new president, and the new vice-presidents are Karl J. Nelson, Harold J. Rose and A. Donald Green.

Mr. Wood, who has been with Enjay since 1939, was appointed assistant general manager of the Chemical Products Department in 1955 and general manager the following year. He headed the Chemical Products Division at Esso Standard's Baton Rouge refinery during 1954 and 1955. A native of Lynchburg, Va., he earned a doctorate in organic chemistry from the Massachusetts Institute of Technology in 1939. He is a member of the American Institute of Chemical Engineers and the American Chemical Society.

Mr. Nelson, who has headed Enjay's Sales Department since July, 1958, has been with the company since 1939, serving as a chemical engineer, product coordinator, product manager and sales manager. He holds a degree in chemical engineering from Cornell University.

Mr. Rose, head of the Products Management Department at Enjay since August, 1958, has been with the company since 1942. He joined Esso Standard as a research chemist at the Baton Rouge refinery, later transferring to the Research Center at Linden, N. J. He served as coordinator of chemicals research since August, 1956. Mr. Rose received his master's degree in organic chemistry at the University of Kentucky, where he was an instructor in chemistry between 1940 and 1942.

Mr. Green, who joined the company as a chemical engineer in 1930, has headed Enjay's New Projects Department since September, 1958. He has served at Esso's Baton Rough Refinery and the Research Center in Linden, N. J. He earned his master's degree in chemical engineering at the Massachusetts Institute of Technology.

Copolymer Appoints Denson

► William P. Denson, Jr., has been named technical representative by Copolymer Rubber & Chemical Corp., Baton Rouge, La. Mr. Denson will handle technical and sales service activities, operating from the Baton Rouge plant. He is a chemical engineering graduate of Louisiana State University, and joined Copolymer in 1958.

Fast-Blending Plasticizer

► Monsanto Chemical Co., St. Louis, Mo., has announced the development of a fast-blending polymeric plasticizer for permanent flexibility in a broad range of general purpose polyvinyl chloride applications. The compound, called "Santicizer 409," is described by Monsanto as highly resistant to extraction and migration, low in both odor and color and highly compatible under humid conditions.

The company claims that 409's efficiency, electrical resistivity and permanence under heat aging make it an ideal plasticizer for wire coatings and film for electrical tape. According to Monsanto, the permanence, low cost and excellent compatibility of the compound should be of interest to manufacturers of general film sheeting and coated cloth. For manufacturers of adhesive-backed films, it is reported to offer the attractions of low color, processing ease and low migration to the adhesive mass.

SPI Sponsors Eighth National Plastics Conference-Exhibit

Rubberlike Plastics Products Feature Week-Long Exposition in Chicago

► A wide variety of new plastic products of interest to rubber users and producers were on display at the Eighth National Plastics Exposition field in Chicago's International Amphitheater, November 17-21, 1958. Attended by more than 25,000 makers, users and marketers of plastic products, the mammoth exposition was held in conjunction with the Annual Conference of The Society of the Plastics Industry, Inc., which on November 18th, began a three-day series of formal sessions at the Morrison Hotel.

One of the highlights of the conference program was an international reception and dinner at which H. E. Humphreys, chairman of the board of the U. S. Rubber Co., was the principal speaker. Mr. Humphreys, whose topic was "The Dynamic World Growth of Plastics," noted the significant contribution which the rubber industry had made to this growth. "Methods of compounding, molding, extruding and curing developed by the rubber industry," he pointed out, "have come in handy in the manufacture of many plastic products."

Conference Sessions

The regular meetings of the Conference featured morning and afternoon sessions covering topics such as sheet forming, management, plastics in building, cellular plastics, plastics in the appliance industry, and the merchandising and distribution of plastic products. Speakers at a special International Forum surveyed recent developments in Argentina, England, Germany, Italy, Japan and the U.S.S.R.

The exposition itself featured more than 200 individual company displays of new and standard industry products. Exhibitors included members of the nation's leading rubber, chemical and petroleum companies as well as representatives of the plastics industry's major manufacturers of products components and equipment. The following were of perhaps special interest to makers and users of rubber.

Among the items featured at the display of the Naugatuck Chemical Division of U. S. Rubber Co. was a new heat-resistant polyester plastic. Designated Vibrin 136A, the newly developed plastic has approximately twice the heat resistance of previous polyester plastic resins used in reinforced plastic application. Its radar transparency is said to be approximately ten times better than that of conventional polyesters.

The display also pointed up the increased use of Kralastic, a semi-rigid plastic pipe material. Both the material and the pipe were shown generally for the first time at the exposition.

Dramatic new advances in the utilization of versatile vinyl plastic materials in home construction highlighted the myriad of vinyl applications in the B. F. Goodrich Chemical Co. exhibit. Illustrations included new products made possible by the wide range of properties available with the company's Geon polyvinyl materials.

The exhibit of the Firestone Plastics Co. featured complete lines of vinyl chloride polymers and copolymers available under the tradename Exon. This included elastomeric compounds, new latices and new nylon molding and extrusion materials. In addition, one could pick up some interesting pointers on XR-168, a latex which contains a Styrene-Butadiene type resin in colloidal suspension. The resin is modified to obtain superior adhesion to metal substrates.

The General Tire & Rubber Co. exhibit showed the complete family of specialized PVC resins. On display were end products manufactured with Vygen resins: shoe welting, garden hose, coated wire and molded parts.

Devcon C, a new material for making low-cost rubber and plastic molds was shown at the Devcon Corp. booth. This product is simply poured and formed around a wood or plaster model of the item to be produced.

At the exhibit of Montecatini Soc. Gen. (Chemore Corp.), it was learned that the company will build a 60,000 ton per year plant at Brindisi, Italy, to make propylene-ethylene copolymer for "life-time" automobile tires.

Among the items spotlighted by Witco Chemical Co., Inc. were Fomrez 50, 70 and D25-30, new polyesters for flexible urethane foams. They are said to be widely adaptable to commercial processing equipment and can be used to provide a foam of varying densities.

Royalite Plastics, United States Rubber Co., featured material on Royalite, a copolymer sheet fortified with synthetic rubber. Examples of end products shown included cases, panels, containers, and auto trim.

Equipment shown at the booth of Ralph B. Symons Associates, Inc. included a Goodman vibratory feed inspection table and a rubber mill strip cutter with micrometer control and swing back mount.

Other Interesting Exhibits

Information on acrylonitrile which is used in the manufacture of nitrile rubber, high-impact resins, acrylic fibers and new acrylonitrile derivatives was obtainable at the display of Union Carbide Plastics Co., Division of Union Carbide Corp.

CAO-1, a non-discoloring, non-staining antioxidant for rubber products was shown at the Catalin Corp. of America display. The product can be prepared in emulsion form to protect water-dispersible rubber or rubber-like latices.

Samples of thermoplastic sheet and films in copolymer styrene, rubber modified styrene, cellulose acetate, cellulose acetate butyrate nylon, ethyl cellulose, polyethylene and polypropylene were displayed by Chicago Molded Products Corp.

Atomic Vulcanization Discussed

► Atomic energy is now being used in the laboratory to vulcanize nearly any rubber or rubber-like material with results equal to or better than conventional chemical vulcanization, according to Dale J. Harmon, scientist at the B. F. Goodrich Research Center, Brecksville, Ohio, in a report to the American Chemical Society meeting which was held in Chicago recently. He pointed out however, that the amount of radiation exposure required for the new process now costs about ten times as much as chemical curing.

Advantages of radiation vulcanization include "cold" processing of tires and hundreds of other rubber products much faster than chemical vulcanization, and the ability to vulcanize materials which are difficult or impossible to cure chemically. The atomic process has one economic advantage over present methods. Curing agents such as sulfur and accelerators, which represent a considerable portion of the cost of conventional curing, are not required in radiation vulcanization, Mr. Harmon said. He added "Vulcanization of rubber products by atomic energy can become economically competitive, but only if the cost of radiation is lowered or some way found to reduce the amount of radiation required." He felt that this could be achieved by means of a major breakthrough in electron accelerator technology or if radioisotopes should become available at a much lower cost.

Okonite Merges With Kennecott

► Stockholders of the Okonite Co., Passaic, N. J., have voted in favor of a merger with the Kennecott Copper Corp., New York, N. Y. Under the terms of the merger, Okonite's 1000 stockholders will receive one share of Kennecott for each share of Okonite held. There are about 232,000 shares of Okonite outstanding and the present market price of Kennecott is approximately $100 a share. Okonite will continue to manufacture cables under its own name, as do Kennecott's other fabricating divisions. The company has plants at Paterson, North Brunswick and Passaic, N. J.

Detroit Group Holds Fall Meeting

► Approximately 100 members attended the Fall Meeting of the Detroit Rubber and Plastics Group, held on October 3, 1958, at the Detroit-Leland Hotel, Detroit, Mich. A pre-dinner talk was given by E. Ahlefeld (Farrel-Birmingham) on "Latest in Mill Room Equipment". After dinner, Gus Watson, of the Detroit Red Wings hockey club, gave a talk and showed movies of the 1957-59 Stanley Cup Play-Off Finals.

The new Chicago plant of the Johns-Manville Dutch Brand Division is devoted to the specialized production of pressure-sensitive tapes, adhesives, sponge and custom-molded rubber specialties and combinations of synthetic and organic materials.

Johns-Manville Opens New Plant

► A new plant for the fabrication of pressure-sensitive tapes, adhesives and related rubber products was put into operation on November 12, 1958, at South Chicago, Ill., by Johns-Manville Corp. It is the seventh new factory put into production this year by Johns-Manville, and one of eight new plants in the company's current expansion program. The plant is operated by the Johns-Manville Dutch Brand Division and increases by more than 50 per cent the J-M Dutch Brand Division's capacity for production of pressure-sensitive tapes, adhesives and related rubber products.

At the new plant, J-M took the wraps off a unique "combining" machine that has been several years in development. It is the first equipment of its type ever designed, from the factory floor up, to do the specific job of laminating parallel strands of organic or synthetic materials on flexible sheets. Materials already successfully joined in various combinations on the unique equipment include glass fibers, paper, acetate, rayon, cellophane, nylon, asbestos paper, cotton, rubber, woven fabrics, building paper, lurex, aluminum foil, copper, mylar, vinyl and polyethylene.

Enjay To Build New Lab

► Enjay Co., Inc., New York, N. Y., has adopted "Escon" as a trademark for world-wide marketing of polypropylene and is beginning construction of a 30,000 square foot plastics wing as an addition to its customer-service research laboratories at Linden, N.J. The new plastics wing, according to A. Bruce Boehm, executive vice-president of Enjay, will be devoted almost entirely to customer research and service on Escon. An accelerated construction schedule provides for completion of the facility by the Fall of 1959.

Connecticut Rubber Group Meets

► The Connecticut Rubber Group held its technical meeting on November 14, 1958, at Donat's Town-Ho, Milford, Conn. The meeting was featured with a talk by Clark E. Stair (Firestone), whose topic, "Four for the Road," was concerned with racing tires and racing in general. A sound film, "The 500 Mile Challenge," about the 1958 Indianapolis race, was one of the highlights of the meeting.

Bell Develops New Antioxidants

► Polymer Research Department of the Bell Telephone Laboratories, New York, N. Y., has discovered a new class of sulfur-containing thermal antioxidants, which are said to be effective in the presence of carbon black, for use as protectants in polyethylene. The original antioxidant used to protect polyethylene was found to be incompatible with carbon black. Many different types of known antioxidants have been examined under varying conditions since then. During such experiments, it was found that the behavior of a commercial antioxidant which contained sulfur actually gained effectiveness as an antioxidant and that its total protection against oxidation exceeded the sum of the separate contribution of carbon black and the sulfur antioxidant. Through these experiments, the laboratories have discovered two new promising compounds. Further studies are being conducted, which, the laboratory states, may lead to a revision of present theories on antioxidants.

John L. Cohill

Firestone Promotes Four

► Four top echelon promotions have been made by the Firestone Tire & Rubber Co., Akron, Ohio. In the move, John L. Cohill becomes vice-president, special assignments, a new post in the company; L. J. Campbell vacates the presidency of Firestone Steel Products Co., to succeed Mr. Cohill as vice-president of all company subsidiaries other than tires; and Mario Di Federico succeeds Mr. Campbell as the Steel Products president. J. J. Robson has been appointed director of tire engineering and development.

Mr. Cohill, a veteran of 38 years with Firestone, began his career in India in 1920. In 1943, he became president of Firestone Aircraft Co., and was named vice-president of Firestone International Co. in 1946. In 1949, he was named assistant to the president of the parent company, and for the past two years has been vice-president of all company subsidiaries other than tires.

Mr. Campbell joined Firestone in 1942 as comptroller of Firestone Aviation Products Division. He then worked as assistant treasurer of G and A Aircraft, Inc., a Firestone subsidiary. In 1945, he went with Steel Products Co. as assistant treasurer and assistant secretary, a position he held until 1951 when he was named vice-president of the company. He became company president in 1952.

Mr. Di Federico joined Firestone in 1947, and was named head of the Manufacturing Engineering Department in 1951. He became factory manager in 1954. In 1958, he was named vice-president in charge of sales for the Firestone Steel Products Co.

Mr. Robson joined Firestone in 1932, and after a period in the company's college training class, went into the Tire Development Department as an engineer. In 1941, he entered the U.S. Army and rejoined Firestone in 1946, and was assigned to the West Coast as manager of manufacturers' sales for the Firestone Tire & Rubber Co. of Calif. He returned to Akron in 1949, as manager of tire engineering. In 1953, he was named manager of the combined Tire Engineering and Development Departments.

Midwest Rubber Names Two

► Midwest Rubber Reclaiming Co., East St. Louis, Ill., has elected Howard R. Erwin vice-president, and appointed C. E. Hart manager of the Paramount, California, plant. Mr. Erwin is a graduate of Iowa State College, having received a B.S. degree in 1932 and a degree in chemical engineering in 1947. He formerly was with Goodyear Tire & Rubber Co. and the Kentucky Synthetic Rubber Co. In 1953, he became deputy director of the Federal Facilities Corp., the organization responsible for operation of the Government synthetic rubber program. In the fall of 1955, Erwin joined, Midwest, serving as manager of the Paramount, Calif., plant until January, 1958, when he was made production manager for the entire company. Mr. Erwin is a member of the American Institute of Chemical Engineers, the American Chemical Society and the Los Angeles, Akron and Northern California Rubber Groups.

C. E. Hart succeeds Mr. Erwin as plant manager at Paramount, He started in the rubber industry in the production department of the Akron Rubber Reclaiming Company, predecessor of Midwest, and became a foreman at the East St. Louis plant in 1928. He has since held posts as general foreman at East St. Louis, superintendent at the Barberton, Ohio, plant and factory manager for the East St. Louis plant. In August, 1956, Mr. Hart became factory manager at the Paramount plant. He is a member of Tlargi and the Akron Rubber Group.

Industry Equipment Suppliers

► Hochman Plastics Machinery Corp. has announced its entry into the field of plastics, rubber and hydraulic machinery, as suppliers of used, rebuilt and new equipment. The principal office is at 151 Mulberry Street, Newark, N. J., and a warehouse has been established at 79-81 Malvern Street, Newark, N. J. Herman M. Newman, named as president of the company, has been active since 1931 as a specialist in plastics, rubber and hydraulic equipment, both in rebuilding and redesigning used machines and in the design and construction of new equipment. Ralph Hochman, secretary-treasurer of the firm, has operated Ralph Hochman & Co., specializing in metal working equipment, used, rebuilt and new.

Daniel J. Rowe

Joins Marbon Chemical

► Marbon Chemical, Washington, West Va., a division of Borg-Warner Corp., has announced the appointment of Daniel J. Rowe as technical sales representative for the East Coast territory. Before joining Marbon, Mr. Rowe was with Catalin Corp. of America, selling styrene, polyethylene and nylon to extruders and molders. He also worked for Sandee Mfg. Co., and Aetna Casualty Co. He attended Wright Junior College in Chicago.

Eastman Color Concentrates

► Eight new Tenite polyethylene standard color concentrates have been introduced by Eastman Chemical Products, Inc., New York, N. Y., which are said to offer thorough dispersion and consistent color in polyethylene products at economical prices. Like the custom-produced color concentrates for polyethylene introduced by Eastman in 1954, the new standard concentrates consist of high-concentration pigments predispersed in polyethylene resin and pelleted for clean and quick mixing with natural polyethylene base material. Use of the new concentrates reduces waste; eliminates messy dry-color mixing; lowers labor and handling costs, and permits color accuracy, Eastman Chemical states. Colors of the new concentrates are white, green, turquoise, blue, light yellow, bright yellow, pink and red.

Glyco Appoints Representative

► Edwin O. Mills has been appointed technical representative for the Glyco Chemicals Corp., New York, N.Y. Mr. Mills holds a B.S. degree in chemical engineering from the University of Nebraska. He will work out of the firm's Chicago office and cover the Northern Illinois, Minnesota and Wisconsin areas.

Philadelphia Elects Officers; Hears Talk On Elastomers

► The Philadelphia Rubber Group elected its 1959 officers at a meeting on October 24, 1958, at the Poor Richard Club, Philadelphia, Penna. Elected to office were: *Chairman,* R. S. Graff (DuPont); *Vice-Chairman,* H. C. Remsberg (Carlisle Tire); *Secretary-Treasurer,* Dick Hendriksen (Phillips Chemical); *Directors,* Hank Smith and Dick Kerr. The meeting was highlighted with a talk by Jack S. Rugg (DuPont) on the subject, "Elastomer Processing—A Look into the Future".

Mr. Rugg stated that as a result of the development of broadly serviceable liquid elastomers, the so-called "mill" room of the future may well be composed largely of tanks, pipes, valves and conveyors. The elastomer will arrive in tank cars and be piped into storage tanks. Automatic mixing machines will call for material from the storage tanks as needed and mixing material will be dispensed automatically as molds pass under the mixing nozzle.

He went on to explain that interest in such a development depends upon the question of why a company should be interested in liquid polymers. Mr. Rugg stated that the answer was two-fold: First, through the use of liquid polymers, the cost of processing rubber goods can be reduced. Second, liquid elastomers will result in superior products with properties not available in other elastomers since a liquid system is not hampered in the chemistry of polymer formation by the need for a plastic processable stage. He then discussed the many methods of using elastomers in processing rubber goods, and concluded his talk by stating that liquid processing is not expected to completely outmode conventional rubber processing as we know it today. Rather, it can be considered as an opportunity for expansion of business and development of new products without the usual high investment cost. The superior properties obtained by the use of liquid elastomers are obtained because of the chemistry of the system.

RUBBER AGE Expands Staff

Berns

Hochman

► RUBBER AGE has announced two new additions to its editorial staff. Bernard M. Berns and Stanley Hochman have been named assistant editors. Mr. Berns is a graduate of Hunter College of the City of New York with a B.A. degree in journalism. He began his writing career as a reporter and feature writer for the *Manhattan (Kansas) Tribune-News,* and later entered the Federal service as assistant editor and production manager for the *Military Review,* a magazine published by the Command and General Staff College, Fort Leavenworth, Kansas.

Mr. Berns served as assistant to the director of advertising at Standard and Poor's Corp., New York, N. Y., and afterwards joined Interstate Industrial Reporting Service as an industrial case history reporter and industrial photographer. During World War II he served in the United States Navy as a combat photographer in the Pacific Theatre.

Mr. Hochman received a B.S. degree from Brooklyn College and an M.A. from Columbia University. He began his professional career in the Syndicate News Department of the *New York Times* and later joined the staff of *Cleaning and Laundry World,* an industrial magazine serving the textile maintenance field. For three years, he edited *Industrial Photography,* a professional magazine reporting on functional applications of photographic techniques in industry, science and research and simultaneously served as executive editor of *Film Media,* a quarterly devoted to promoting the use of cinematographic techniques both in business and industry.

Mohawk Appointments

► Mohawk Rubber Co., Akron, Ohio, has appointed Leighton Reiss as manager of compounding and processing, and Frank M. Johnson as chief chemist at Mohawk's Helena, Ark., plant. Mr. Reiss succeeds Robert M. Hill who was named technical manager of the company's Akron plant. Mr. Reiss was formerly with Goodyear, serving as technical superintendent in South Africa and Peru, and chief chemist in Mexico. He is a graduate of Pennsylvania State University. Mr. Johnson, formerly chief chemist of the Akron plant, joined the company in 1954 and worked in various phases of development.

Antioxidant For Rubber

► Eastman Chemical Products, Inc., Kingsport, Tenn., is producing a line of antioxidants for use by industry in combatting oxidative deterioration. According to the company, antioxidants are used to protect rubber products against the effects of ozone, one of the most powerful and insidious oxidizing agents known. Even minute concentrations in the atmosphere can severely damage rubber products in a short time. To retard cracking and checking caused by ozone, the rubber processor must depend on antiozonants, stated Eastman executives.

Named Executive Vice-President

► The appointment of F. W. Andrews as executive vice-president has been announced by the International Latex Corp., Dover, Del. Mr. Andrews joined the firm in 1945 as manager of the Plastics Development Department. He was named vice-president in charge of research and development for the company in 1955.

To Exchange Technical Knowledge

► Naugatuck Chemical Division of the U.S. Rubber Co., Naugatuck, Conn., and Farbenfabriken Bayer, A. G., one of Germany's largest chemical firms, have agreed to exchange know-how and patents on chemicals used in the manufacture of rubber products. Under the terms of the agreement, the two companies will pool technical knowledge and research resources to tackle problems in the field of rubber chemicals. The purpose of the agreement is to speed the development of chemicals that will improve the service life and usability of rubber, officials of the company stated.

Nopco Appoints Ionescu

► Nopco Chemical Co., Newark, N. J., has appointed M. Ernest Ionescu as manager of the newly formed Special Products Department of the Industrial Sales Division. Mr. Ionescu was educated in Austria and Germany, and at Rensselaer Polytechnic Institute, Troy, New York.

Calvin S. Yoran

Named Technical Director

► Calvin S. Yoran has been named technical director of the Dryden Rubber Division, Sheller Manufacturing Corp., Keokuk, Iowa. Mr. Yoran formerly was research director for the Brown Rubber Co. After graduating from the University of Chicago in 1930 with a B.S. degree in chemistry, and obtaining his Ph.D. in organic chemistry in 1933, he joined the Featheredge Rubber Co., Chicago, Ill., becoming chief chemist. In 1942, he began work as chief chemist for Witco Chemical Co., Chicago, Ill. He is a member of the American Chemical Society, American Institute of Chemists, American Society for Testing Materials, Society of Automotive Engineers and Society of the Plastic Industry.

Research Director Retires

► Dr. George Denton Beal, distinguished scientist, will retire as a director of research at the Mellon Institute, Pittsburgh, Penna., after 32 years with that organization. Dr. Beal has had a notable career in chemical research, pharmaceutical investigation and education, and research management in a number of industrial fields. The author of nearly 100 publications and the holder of several patents, Dr. Beal has received many honors including the Ebert Prize and the Remington Honor Medal from the American Pharmaceutical Association, and the Pittsburgh Award of the American Chemical Society. Born in Scio, Ohio, he was educated at Mount Union College and received his A.M. and Ph.D. degrees from Columbia University. He holds the honorary degree of Sc.D. from both Mount Union and Rutgers University. member of the Board of Trustees of Dr. Beal has held major offices in the American Chemical Society, the Pennsylvania Chemical Society, and the American Pharmaceutical Association. He is president of the American Council on Pharmaceutical Education and a the convention which prepares the Pharmacopeia.

High Viscosity Polybutene

► Amoco Chemicals Corp., Chicago, Ill., has announced the addition to their line of a new Indopol polybutene with unusually high viscosity. This line now includes 10 products with viscosities ranging from 40 SSU at 210°F. to the new "Indopol H-1900," reported to have a viscosity of about 20,000 SSU at 210°F. According to Amoco, electrical cable oil and specialty sealants for refrigerator and automotive use are among the applications for which the new high viscosity product was developed.

Other applications for which Indopol H-1900 may be used include use in adhesives and pressure sensitive tapes, as a thickening agent and as a capacitor insulation impregnant. The company reports that it may also be used in lubricants to improve shear stability and as a viscosity index improver. According to Amoco, Indopol H-1900 is non-drying, light in color and stable to sunlight, moisture resistant and thermally decomposes without residue at temperatures above 650°F. It also exhibits excellent electrical properties.

Porter To Merge With Thermoid

► H. K. Porter Co., Inc., Pittsburgh, Penna., has announced that it will merge with the Thermoid Co., Trenton, N.J., under a plan which would make Porter the surviving company. The merger plan, agreed upon by directors of the two companies but subject to approval by the stockholders, would give Thermoid shareholders one share of 5½ per cent cumulative preference stock in the surviving company for each six shares of Thermoid common. Holders of Porter common stock and 4¼ per cent preferred will receive similar shares in the surviving corporation on a share-for-share basis. Porter and its subsidiaries make industrial rubber products, forged steel fittings and electrical devices. Thermoid and its subsidiaries make automotive friction and rubber products, and hard and soft rubber molded goods and plastic products.

Rubber Compatible Papers

► U. S. Army researchers have shown that volatile corrosion inhibitor (VCI) papers are compatible with rubber formulations and can be used for preservation where other materials might have very destructive effects. Evaluation of VCI-protected rubber compositions under moist and dry aging at 130°F. showed the papers to have only slight effects on swelling, elongation, and tensile-strength properties of the rubbers. The effects were observed to be negligible in comparison to those of many mineral oil base preservations on rubbers.

E. R. Mako

Joins General Magnesite

► E. R. Mako has been appointed Midwest representative for General Magnesite & Magnesia Co., Plymouth Meeting, Penna. Mr. Mako formerly was sales manager with the Manufacturers Chemical Co. of Philadelphia, Penna., and specialized in chemical specialties and latex compounding. He will make his headquarters in Cleveland, Ohio, offering magnesia chemicals to the rubber and other industries.

Thiokol Releases Three Bulletins

► Thiokol Chemical Co., Trenton, N. J., has announced the availability of three bulletins including Bulletin 103-1, entitled "A Study of Process Oils as Butyl Plasticizers"; Bulletin 104-3, "Evaluation of Non-Black Fillers For Colored Butyl Compounds, Group III—Clays"; and Bulletin 105, "A Study of Butyl Ozone Resistance." The first, Bulletin 103-1, evaluates various process oils as extenders and plasticizers in Butyl rubber to show the effects these oils have on Butyl rubber physicals. Process oils tested were Circo Light Process Oil, Process Oil 515, G. B. Light Process Oil, Faxam 40, and Necton 45 and 60. In the second report, Bulletin 104-3, the company made a study to establish fillers, or blends of fillers, which would provide smooth colored butyl extrusion compounds, and to develop effective butyl compounds with these fillers. This study dealt specifically with clays. The last Bulletin, 105, evaluates the relative ozone resistance of molded butyl rubbers and the general effect of cure time, filler materials and additives on ozone resistance.

New General Winter Tire

► General Tire & Rubber Co., Akron, Ohio, has introduced a new winter tire which, according to the company, can be used all year-round. The tire, known as "Safety Winter Cleat", was built for high-speed turnpike operation, and provides equally as good traction as an ordinary winter tire, the company claims. General states that the new tread design of the tire provides a smooth ride on snow or ice-free roads.

R. & J. Dick Has New Location

► R. & J. Dick Co., Inc., has transferred its main office and factory from Passaic, N.J., to a new suburban plant in Totowa, N.J. The company, which manufactures conveyor pulleys, plastic belting, balata belting, sheaves and other transmission and conveying equipment, had been located at the Passaic plant for nearly 50 years. According to Robert Reid, president of Dick, the construction of the new home office and factory fits into a company growth program that has also included some of the most outstanding developments in the power transmission and conveying field. Besides the Totowa plant, the company has a factory in Muscatine, Iowa, and branches and warehouses in several other cities.

Carlon Finishes Addition

► Carlon Products Corp., Aurora, Ohio, has completed its million dollar expansion program with the erection of a new plant which is reported to be able to produce approximately 15 million feet of plastic pipe a month. The manufacturing plant contains extruding facilities for making all types of plastic pipe and fittings under one roof. The firm, an affiliate of American Research and Development Corp., operates seven other plants.

Nylon Custom Super Cushion

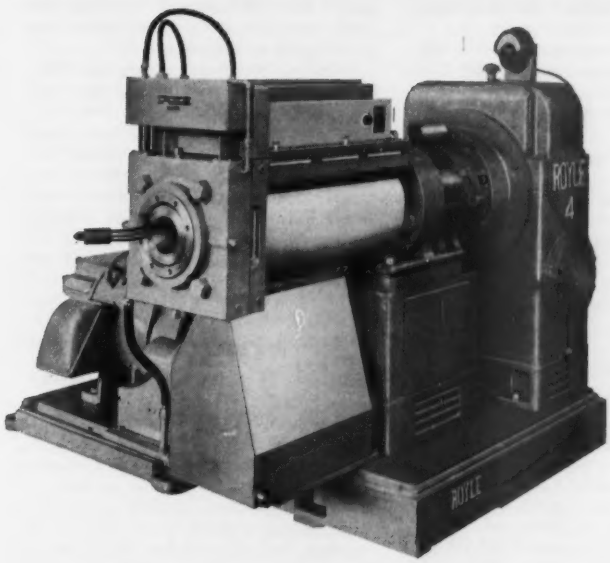
► A new auto replacement tire called the "Nylon Custom Super Cushion," that is "relaxed" when inflated for service, has been developed by the Goodyear Tire and Rubber Co., Akron, Ohio. Processed by a new tension-free shaping method said to "pre-fit" the tire for the road, the tire has been engineered to meet requirements of today's more powerful automobiles and high-speed roadways. The method, in which the tire is held in shape under pressure until cool, is said to relieve pull and stretch on the cord, body and tread, especially when the tire is mounted and inflated and overcomes shrinkage which normally takes place when a tire is removed from its mold. This tension-free shaping method, a wider and deeper tread and improved traction design enable the Nylon Super-Cushion to take the pounding of heavy, high powered automobiles during long, fast runs on super roads, the company states. Goodyear development engineers found in "wear to smooth" evaluations that the tire lasts 26 per cent longer than previous tires of its type. Priced just slightly higher than regular tires, the new tire is being distributed nationwide in a full range of 14 and 15 inch sizes, tubeless. Tube-type versions are also available.

New Sherwin-Williams Pigment

► "Solfast Blue G 43100", a stable phthalocyanine blue pigment, which is reported to be able to produce a new green shade, has been developed by the Pigment, Color & Chemical Division of the Sherwin-Williams Co., New York, N. Y., for use in rubber products. The company claims that the pigment's outstanding heat and light resistance and non-bleeding properties of the phthalocyanines, plus the desirable shade of 43100 make it attractive for use in rubber products. It has an exceptionally jet masstone and bright green undertone. From deep shades to delicate pastels, the brightness of 43100 is reported to be useful as a primary pigment or mixed with yellows to make cleaner greens. This new pigment may be dispersed to its ultimate desirable characteristics with a minimum of grinding, according to the company.

Independent Die Promotes Two

► Independent Die & Supply Co., St. Louis, Mo., has promoted K. C. Free to vice-president in charge of sales and W. J. Jordan to vice-president in charge of production. Mr. Free has been with the company for 20 years, and Mr. Jordan has had 28 years of service.



ROYLE SPIROD®

For Maximum Versatility

Whether you are extruding plastics that require high processing temperatures or quick-curing compounds Royle Spirod —the all purpose, all-electric, completely automatic extruder —provides positive temperature control. This versatility is the result of combining a proportioning controlled system of high velocity evaporative cooling with tubular resistance heating to supply constant, accurately zoned processing temperatures.

Send for Bulletin Number 463

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England	Home Office	Akron, Ohio	Downey, Cal.	Tokyo, Japan
James Day (Machinery) Ltd.	V. M. Hovey J. W. VanRiper	J. C. Clinefelter Co.	H. M. Royal, Inc.	Okura Trading Co., Ltd.
Hyde Park 2430 - 0456	SHerwood 2-8262	BLackstone 3-9222	TOpaz 1-0371	(56) 2130 - 2149

Names in the News

Thomas A. Robertson, who has been with Firestone Tire & Rubber Co., Akron, Ohio, since 1941, has been named manager of tire engineering, and **Melvin P. Hershey,** also with the company since 1941, was named manager of engineering for passenger, racing and airplane tires and related products.

John W. Pfeiffer, formerly associated with American Cyanamid, has joined Amoco Chemicals Corp., Chicago, Ill., for export sales.

Jerome C. Isham, public relations manager for Seiberling Rubber Co., Akron, Ohio, has been elected chairman of the Barberton, Ohio, Red Cross.

Edward J. Kraus has joined Tracerlab, Inc., Waltham, Mass., as New England industrial engineer. He formerly was associated with R. S. Pettigrew, St. Regis Paper and Sealright Co.

L. J. McKinley, with Schutte and Keorting Co., Cornwells Heights, Penna., for 10 years, has been appointed district manager of the company's new Buffalo, N.Y. office.

Robert W. Kerr, vice-president of the American Machine & Foundry Co., New York, N.Y., has been named chairman of the new Machinery & Equipment Division of Muscular Dystrophy Associations of America, Inc.

Roger S. Firestone, president of Firestone Plastics Co., Pottstown, Penna., and a director of Firestone Tire & Rubber Co., Akron, Ohio, has been re-elected president of United Cerebral Palsy Associations Inc.

W. S. Chinery, has retired as vice-president and technical director of Industrial Rubber Goods Co., St. Joseph, Mich.

S. William Riley, formerly chief project engineer, has been appointed chief engineer for the Quaker Rubber Division, H. K. Porter Co., Inc., Philadelphia, Penna.

Dr. D. R. Smith, with Union Carbide Corp., New York, N.Y., since 1956, has been named product manager in the New Chemicals Group of Union Carbide Chemicals Co., a division of Union Carbide Corp.

John V. Lynn, previously associated with Fluor Corp., Ltd., has been appointed manager of the new methanol plant in Brazil for the Borden Chemical Co.

H. J. Mackin, district manager in New York City for the Industrial Products Division of the Goodyear Tire and Rubber Co., has been promoted to assistant manager, eastern region, with headquarters in New York City.

Edward J. Geise, former sales manager of Vibrin polyester resins for the Naugatuck Chemical Division of the U. S. Rubber Co., has been appointed assistant manager of the division's commodity sales.

Thomas B. MacDonald has been appointed plant engineer of the polyvinyl chloride operation at Leominster, Mass., for the Borden Chemical Co., while **John Kehn** has been named pilot plant engineer at that facility.

A. E. Whitney, Jr., formerly special representative in New York for the Chemical Division of the Goodyear Tire and Rubber Co., has been appointed regional field sales manager for the company's vinyl resins.

Fred E. Huss, who has been in the materials handling industry for 15 years, has been appointed exclusive sales and service representative in Northwestern Ohio for Lewis-Shepard Products, Inc.

Robert J. Cote, research chemist at the main research laboratories of the Mobay Chemical Co., has been named project leader for Vulkollan.

Stanley Arasim, Jr., who joined the marketing research section of the Atlas Powder Co. in 1957, has been appointed marketing research manager in the Product Development Department of the company's Chemical Division.

W. E. Crouch, formerly assistant manager of tires, batteries and accessories for the Skelly Oil Co., has been appointed manager of the Automotive and Allied Products Department for the U. S. Tires Division of the U. S. Rubber Co.

William V. Miller has been appointed sales engineer and **Cletus J. Brehme,** technical service engineer of girdler catalysts for the Chemical Products Division of Chemetron Corp. Both were formerly operating engineers with the company's Girdler Construction Division.

Albert A. Nelson, who formerly conducted sales research for the Gibson Art Co., has been appointed commercial research manager of Emery Industries, Inc.

Sam Salem

General Tire Appoints Salem

► General Tire and Rubber Co., Akron, Ohio, has announced the appointment of Sam Salem, vice-president of A. M. Byers Co., as general manager of the company's Chemical Division. He succeeds Dr. A. L. Antonio, who is returning to General Tire's rocket propulsion subsidiary, Aerojet-General Corp., Azusa, Calif. Mr. Salem, who has been with General Tire since 1950, was named vice-president of the A. M. Byers Co., Pittsburgh, Penna., in 1957, shortly after General Tire acquired controlling stock interest in that company. He will continue to hold his Byers' presidency in addition to his most recent appointment.

Prior to his Byers' assignment, Mr. Salem served as assistant director of manufacturing for General Tire. He was also manager of the company's Textile and Adhesive Development Departments, and served in chemical engineering assignments in Portugal and Israel. He is a graduate of Purdue University, where he earned both his B.S. and M.S. degrees in chemical engineering.

Hydraulic Brake Cylinder Cups

► A new "High Heat Resisting (HHR) Compound" has been developed by the Thermoid Co., 200 Whitehead Road, Trenton, N. J., for the manufacture of all Thermoid Hydraulic Brake Cylinder Cups. The new compound is said to assure maximum durability under the high operating temperatures present in modern braking systems. According to the company, a carefully selected assortment of 102 Thermoid HHR Hydraulic Brake Cylinder Cups gives complete coverage on all popular passenger cars and many light trucks. With this assortment, a clear plastic compartment container is furnished with an index on the container lid to indicate correct cup size for any installation.

Measuray Thickness Gage

► Sheffield Corp., Dayton, Ohio, a subsidiary of Bendix Aviation, has introduced the "measuray" non-contact X-ray thickness gage which provides continuous thickness control to help lower production costs and improve quality. In order to introduce the unit to industry, a standard model Measuray gage consisting of an X-ray scanning unit and an electronic generator with built-in setting control is being carried about the country in a station wagon. It can be set up and be in operation on a producing or sorting line within an hour. The new demonstration service is available without charge or obligation to producers and fabricators of rubber, plastic film, cellophane, paper, glass, foils, and thin metal strips.

The gage features an ultra-fast gaging cycle, enabling it to be used with high-speed electronic sorting and classifying devices, automatic strip thickness controls, recorders and other accessories. Its low-intensity X-rays scan films and foils as than as .0002-inches speeding by at rates up to 100-feet per second. Reservations for a Measuray demonstration may be made through the local Sheffield representative or the company's Autometrology Division.

Thiokol Science Award Winner

► Frederick R. Reardon of Philadelphia, Penna., 26 year old graduate student of rocket science at the Forrestal Research Center, Princeton University, has been named winner of the first annual Thiokol-ARS Achievement Award for Advanced Study in Rocket Science. The announcement was made jointly by the sponsors, the Thiokol Chemical Corp. and the American Rocket Society, who established the award to materially assist gifted university students to pursue advanced study in rocket science. The award consists of a gold medal and $1,000. Reardon was cited for his advanced work in liquid propulsion rocket motors, in which he developed a unique fuel control system which has become a standard tool of great importance to the industry.

Plans Expansion Program

► Plans to expand furnace black capacity by 50 per cent have been initiated by the Continental Carbon Co. for the carbon plant at Ponca City, Okla. Work on the project, which will expand the plant's capacity from 50 million pounds to 75 million pounds annually of all grades of furnace black, will start within the next few months and completion is expected by the end of 1959. Continental presently has a staff of some 45 persons at its Ponca City carbon black unit, which was completed in 1954. The new plant addition will be devoted to the production of premium quality furnace black.

Government Posts Available

► United States Civil Service Commission, Washington, D. C., has announced that government posts of an applied scientific or technological nature are now open to application. The positions offer from $4,980 to $12,770 and are located in various federal agencies in Washington, D. C., throughout the United States and overseas. To qualify, applicants must have had appropriate experience in one or more of the following specialized fields: rubber and plastics, adhesives, bituminous products, ceramics, drugs and chemicals, food preparation equipment and food logistics, glass, leather, medical supplies and equipment and prosthetic devices, military apparel and equipage, paints and other protective coatings, paper and pulp, petroleum fuels and lubricants, photographic processes and supplies, solid fuels, textiles and textile fibers, aviation survival equipment, industrial radiography, packaging and preservation, and photographic equipment. Applications for these positions will be accepted until further notice and must be filed with the U. S. Civil Service Commission, Washington 25, D. C.

Develops New Phthalocyanine

► A very red-shade crystal stable phthalocyanine blue, designated as "Cyan Blue XR-55-3770", has been made available to the color-consuming industries for the first time by the Pigments Division of American Cyanamid Co., New York, N. Y. This new red-shade blue colorant is an all-purpose, full strength copper phthalocyanine pigment. Its crystal stability is demonstrated both at elevated temperatures and in aromatic solvent systems. Cyan Blue XR-55-3370 has a specific gravity of 1.52; weighs 12.7 pounds per gallon; has a bulking value of 0.0787 gallons per pound; an oil absorption rate of 19.2, and has a specific resistance (ohm-cm) of 15,000. Its resistance to bleed in solvents is excellent, and it has excellent acid and alkali stability, light fastness and durability.

Carbide Develops New Catalyst

► Union Carbide Chemicals Co., Division of Union Carbide Corp., New York, N. Y., has announced the development of a new catalyst for the manufacture of polyether urethane foams. The company reports that the new catalyst, "Niax Catalyst D-22", is a special grade of dibutyl tin dilaurate suitable for the intended application. Carbide states that studies have shown that Niax Catalyst D-22 is many times more active than fast amine catalysts now used by the industry. Because of this fast, tremendous activity, the company reports, it has been possible in preliminary evaluations to effect a one-step conversion of polyethers to polyether urethane foams.

Now is the time to become a SUBSCRIBER TO ADHESIVES AGE!

Simply fill in the coupon below, and return it to us. We'll start your subscription immediately.

ADHESIVES AGE is being published to meet an urgent, growing need for accurate, timely, on-the-job information about adhesives—their manufacture, use and application.

Here's the valuable help you'll get every month

. . . news, information and practical ideas that will be useful in your daily work if you make, work with and use adhesives.

. . . reports of significant developments in this tremendously expanding industry . . . new technology, materials, methods, applications, techniques, products.

And . . . you'll find ADHESIVES AGE factual, authoritative, thorough—easy to read, easy to use—written in plain everyday language, heavily illustrated, always interesting, always practical . . . and always helpful!

As a subscriber, you will receive a full year . . . 12 monthly issues . . . of ADHESIVES AGE for only $5.00. Send your order in today!

ADHESIVES AGE
101 West 31st Street, New York 1, N. Y.

I want to become a subscriber to ADHESIVES AGE starting with the next issue, at the low rate of $5.00 for one year (12 monthly issues).

Add 50c for Canadian subscriptions; $1.00 for foreign.

Name

Company

Address

City Zone State

Title

Our company produces the following products:

Financial News

Columbian Carbon

► Nine months to September 30: Net income of $2,738,000, which is equal to $1.70 per share, compared with $3,396,000, or $2.11 a share, during the same period of the preceding year. Net income figures for the 1958 three-quarter period include a special credit of $394,000, or 24c a share, from the sale of properties. Sales in the first nine months of 1958 total $47,470,000, compared with $52,610,000 in the 1957 nine month period.

Sheller Manufacturing

► Nine months to September 30: Net loss, after tax credit, of $458,633, which is equal to 48c per share on the 953,280 shares of common stock currently outstanding, compared with a net income of $1,511,993, or $1.59 per share, for the corresponding months of 1957. Sales in the first nine months of this year amounted to $19,480,084, compared with $31,510,379 in the comparable period of 1957.

General Tire

► Nine months ended August 31: Estimated earnings of $5,331,368, which is equal to 91c per share of common stock, compared with $8,545,592, or $1.61 per share, in the equivalent period of 1957. Sales in the 1958 fiscal nine month period totaled $321,405,954, compared with $311,091,049, in the corresponding period last year.

Goodall Rubber

► Nine months to September 30: Net income of $267,778, which is equal to 56c per common share, compared with $490,525, or $1.02 a share, at the same time last year. Sales in the first nine months of 1958 totaled $8,027,173, compared with $9,302,097 during the corresponding period of the preceding year.

United Carbon

► Nine months to September 30: Net income of $3,752,792, which is equal to $3.14 per share, compared with $4,598,258, or $3.85 a share, in the first nine months last year. Sales in the first nine months of this year totaled $40,581,352, compared with $43,942,633, during the same period last year.

Thermoid

► Nine months ended September 30: Net income amounted to $294,434, equal to earnings of 29c per share of common stock, compared with $969,294 which earned $1.08 per share of common for the same period of 1957.

Union Asbestos & Rubber

► Nine months ended September 30: Net loss, after tax credit of $121,631, of $112,275, compared with net income, after nonrecurring income equal to 20c a share, of $572,888, equal to $1.20 per share of common for the same period in 1957. Net sales for the first nine months of 1958 were $6,784,279, compared with $9,916,993 for the same period of 1957.

Minnesota Mining

► Nine months ended September 30: Net income amounted to $29,778,080 which earned for each common share of stock $1.75, compared with $29,625,485, equal to $1.75 per share of common for the same period last year. Net sales for the first nine months totaled $271,366,401, compared with $274,225,317 for the same period of 1957.

Triangle Conduit

► Nine months ended September 30: Net income of $1,760,194, equal to $1.30 per share of common stock, compared with $2,641,729, equal to $1.94 per share for the same period in 1957. Net sales in the first nine months of 1958 were $41,260,831 compared with $43,603,806 for the same period in 1957.

Allen Industries

► Nine months to September 30: Net income of $346,098, equal to 51c per share of common, compared with $1,260,072, equal to share earnings of $1.86 in the same period of 1957. Sales in the first nine months totaled $21,825,256, compared with net sales, for the same period in 1957, of $34,151,303.

Seiberling Rubber

► Nine months ended September 30: Net income of $602,941, equal to $1.07 per share of common stock, compared with $884,043, equal to $1.71 per share of common stock in the same period of 1957. Net sales were $14,186,266 in the period ending September 30, compared with $12,273,133 in the same period of 1957.

Mansfield Tire

► Nine months ended September 30: Net income of $1,775,543 which is equal to $2.84 per share of common stock, as compared with $1,109,380, equal to $1.82, in the same period of 1957. Net sales totaled $49,222,445 compared with $46,611,529 during the first nine months of 1957.

Cooper Tire

► Nine months to September 30: Net income was $593,997, equal to common share earnings of $1.89, compared with $295,247, equal to $1.05 per share of common for the same period last year. Net sales in the nine month period amounted to $22,062,826, compared with $17,997,331 for the like period of 1957.

Hewitt-Robins

► Nine months ended September 30: Net income was $701,630, equal to $1.68 per common share, compared with $862,861, equal to common share earnings of $2.09 for the like period last year. Net sales for the first nine months amounted to $36,050,320, compared with $41,405,500 for the same period of 1957.

Goodrich

► Nine months ended September 30: Net income amounted to $23,411,892, earning $2.61 per share of common stock, compared with $30,254,077, equal to $3.38 per share of common in the same period of 1957. Net sales totaled $508,465,253 compared with $560,802,565 in the same period last year.

U.S. Rubber

► Nine months ended September 30: Net profit of $14,235,514, equivalent to $1.80 per share of common stock, compared with $22,982,452, equal to $3.33 a share, in the same period of 1957. Net sales for the nine months were $607,104,417, compared with $665,360,840 for the same 1957 period.

Clevite

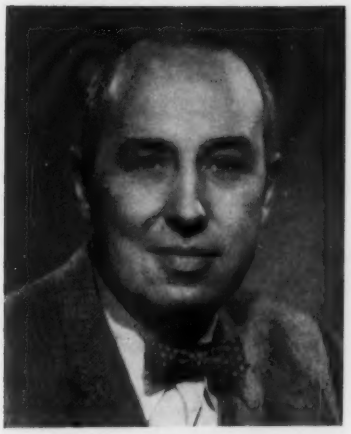
► Nine months to September 30: Net income of $2,116,792, equal to $1.08 per share of common stock, compared with $3,553,195, equal to $1.87 per share of common in the same period of 1957. Sales in the first nine months were $46,921,553, compared with $57,070,903 in the same period of 1957.

Pittsburgh Coke

► Nine months ended September 30: Net income was $715,000, equal to 34c per share of common stock, compared to $2,477,000, equal to $1.87 in the same period last year. Sales in the first nine months of 1958 amounted to $33,295,000, compared with $40,714,000 during the same period of 1957.

Electric Hose

► Year ended August 31: Net income amounted to $877,885, equal to common share earnings of $2.44, compared with $1,389,360, equal to $3.86 per share of common for the like period of 1957. Net sales totaled $16,370,537, compared with $18,729,479 for 1957.



Robert D. Scott

Appointed Goodrich Vice-President

► Robert D. Scott has been named vice-president, development of B. F. Goodrich Chemical Co., Cleveland, Ohio, succeeding Harry B. Warner, who was recently appointed vice-president, marketing, of Goodrich Chemical. Mr. Scott has been vice-president, manufacturing, of the company since May, 1955. He joined Goodrich Chemical as a chemist in the Akron rubber laboratories in 1935 after receiving a B.S. degree in industrial chemistry from the University of Kentucky in 1934 and a M.S. degree in chemical engineering from M.I.T. the following year. He was transferred to the Akron chemical plant soon after joining the company and became technical superintendent in 1940. Later that year, he became general foreman of a new plant under construction, for the manufacture of vinyl resins, at Niagara Falls, New York.

Mr. Scott became manager of the Niagara Falls' plant in 1941 and, in 1942, was named manager of the company's new plant in Louisville, Ky. In 1951, he was made general manager of plants for Goodrich Chemical, and was elevated to a vice-presidency in May, 1955. He attended the Harvard Business School advanced management program in 1953, and is a member of the American Institute of Chemical Engineers.

Ethylene Plant On Stream

► Jefferson Chemical Co., Inc., Houston, Texas, has announced that its new ethylene plant, first of several units to be completed as a part of a major expansion program, is now on stream at Port Neches, Texas. According to Jefferson, the new unit will triple the company's production capacity for ethylene, used by them as a starting material in manufacturing numerous other chemicals. In addition, the company reports, the over-all expansion will double the plant's capacity for ethylene glycol.

Three Firestone Appointments

► Firestone Tire and Rubber Co., Akron, Ohio, has announced that William J. Fogarty has been appointed manager of labor relations for the company, and will be succeeded by W. E. Bray as manager of industrial relations at the Des Moines, Iowa, plant. Fred Becker, previously assistant manager of industrial relations at Pottstown, Penna., will succeed Mr. Bray as manager of industrial relations at Noblesville, Ind. Mr. Fogarty joined Firestone 20 years ago while still a student a Akron University. After graduation, in 1941, he entered the company's college training class. Since then, he has been a member of the supervisory staff of the Barrage Balloon Division; a member of the Time Study Department in Akron; manager of industrial relations for the Ravenna (Ohio) Arsenal, Inc., the Firestone subsidiary operated for the government; and manager of industrial relations in Des Moines. From 1942 to 1944, Mr. Fogarty served with the U. S. Army.

Mr. Bray began his career with Firestone in 1936 as a member of the Time Study Department. In 1942, he entered the U. S. Army and in 1945, he was loaned to the government by Firestone as a member of the Wage Stabilization Board in Washington, D. C. He returned to Akron in May, 1946 as supervisor of training and served in this capacity until going to Noblesville in 1948.

Mr. Becker became associated with Firestone in the Factory Employment Department, Akron, in 1942. He has held several positions with the company, including staff assistant in the Industrial Relations Department; industrial relations manager at the Firestone tire plant in Sao Paulo, Brazil; industrial relations manager of Firestone's New Bedford (Mass.) Defense Products plant, and assistant manager of industrial relations in Pottstown, Penna.

Accelerator For Resins

► Wallace A. Erickson & Co., Chicago, Ill., has announced the availability of commercial quantities of a technical grade of N,N-Dimethyl-p-Toluidine for accelerating the cure of polyester-styrene resins. Heretofore, this chemical, called "Accelerator DMT," has been available only as a highly refined product, and the cost limited its use to the cure of dental acrylics. The amount of N,N-Dimethyl-p-Toluidine required will vary from 0.001 to 0.1 per cent, depending upon the desired rapidity of cure. Most general purpose polyester-styrene resins will gel in approximately one minute at room temperature with the use of 0.1 per cent of Accelerator DMT and one per cent benzoyl peroxide, reports Erickson. The chemical is suitable for use as an accelerator in most peroxide-catalyzed reactions conducted in non-aqueous media.

Raymond H. Marks

Named Vice-President

► Raymond H. Marks has been appointed vice-president in charge of sales for Cary Chemicals Inc., East Brunswick, N. J., succeeding Thomas Zawadzki who is now vice-president in charge of production development. Mr. Marks graduated from North Carolina State College in 1943 with a B.S. degree in chemical engineering. He then served in the United States Army until 1946. Prior to joining Cary in February, 1958, he was associated with Monsanto Chemical Co., Inc., in various research and sales capacities.

Mohawk Retires Bond Issue

► Mohawk Rubber Co., Akron, Ohio, has presented a check in excess of $3¼ million to the Helena-West Helena, Arkansas Industrial Development Corp. to retire a 10-year bond issue eight years in advance of the maturity date. The money was originally borrowed a little over two years ago to help finance the acquisition of a new tire plant in West Helena. Today the plant and equipment are valued at more than $3 million, H. M. Fawcett, Mohawk's president, disclosed. In paying off the balance of the bond issue, Mr. Fawcett said the West Helena facilities have played a vital role in helping Mohawk reach the increased sales goal set for the company. The Arkansas plant has undergone expansion three times since going into operation in 1956, and a fourth expansion is being planned.

Armstrong Rubber Places Notes

► Armstrong Rubber Co., New Haven, Conn., has placed $4,500,000 of 15-year notes with several insurance companies headed by Massachusetts Mutual Life Insurance Co., who purchased $1,500,000 of the notes, bringing its holdings of Armstrong securities to approximately $3,700,000. Proceeds from the sale will be used for Armstrong's expansion program.

ADM Elects Three Executives

► The board of directors of the Archer - Daniels - Midland Co., Minneapolis, Minn., has announced the election of John H. Daniels as president and chief executive officer; Thomas L. Daniels as chairman of the board; and Richard G. Brierly as executive vice-president.

John Daniels joined ADM in 1946 after his World War II service. After three years as a flax buyer for the company at the Minneapolis Grain Exchange, he spent two years as assistant sales manager of the Packaged Linseed Oil Department. He was made assistant sales manager of the Linseed Oil Division in 1951 and sales manager in 1953. In 1955, he was elected an assistant vice-president, and was placed in charge of production and procurement for the Alfalfa Division in 1956. In 1957, he was elected a vice-president and director of the company and named manager of the Formula Feed Division.

Thomas L. Daniels, president of ADM since 1947, began his business career in 1914 as a bookkeeper for the company. After serving as a major with the U. S. Army in World War I, he returned to ADM but left in 1921 to enter the U. S. diplomatic service. He rejoined ADM in 1929, was elected a director and assistant treasurer the same year and became a vice-president in 1933. In 1942, he resigned from ADM to become chief of the Fats and Oil Branch, Chemical Division, War Production Board. On his return to ADM in 1943, he was elected a director, vice-president and member of the executive committee. He became executive vice-president in 1946 and president in 1947.

Richard G. Brierly joined ADM in 1942 and became manager of the Soy Flour Department in 1943. He was appointed manager of the Soy Products Division in 1945 and was elected an assistant vice-president in 1948. In 1952, he was named assistant to the manager of the Alfalfa Division and was placed in charge of production the following year. He was elected a vice-president and named manager of the Alfalfa Division in 1956 and was elected a director of ADM in 1957.

Federal Tire Pay

► The United Rubber Workers and the rubber industry have concluded testimony in U. S. Department of Labor hearings to establish a minimum rate to be paid on all government contract work. The union recommended a $1.93 rate on the basis of its interpretation of statistics gathered by the Bureau of Labor Statistics. Counsel for the rubber industry recommended a $1.54 rate based on the same statistics. The minimum wage for government tire, tube and retread work will be set somewhere between the $1.54 and $1.93 rate.

40 Millionth Tire

► Victor Holt, Jr., executive vice-president of sales for the Goodyear Tire & Rubber Co., Akron, Ohio, appears to be lifting a 1000 pound earthmover tire, the 40 millionth tire produced at the firm's tire plant at Topeka, Kans. Members of the Goodyear board of directors and community leaders were on hand when the milestone tire was pulled from the mold.

Houdry Develops Dabco

► Houdry Process Corp., Philadelphia, Penna., states that odorless, flexible, semi-rigid or rigid urethane foams from all commercial urethane grade polyols can be produced with the use of "Dabco". The company claims that Dabco provides fast cure by eliminating the prepolymer step; can be processed in existing equipment; and is economical because of its low catalyst concentration. Dabco produces foams with such physical properties as low compression set; uniform cell structure; excellent tensile, tear strength and elongation; dimensional stability; resistance to humid aging; good molding characteristics; and no odor, Houdry states.

Awarded Rebuilding Contract

► The United Engineering & Foundry Co., Pittsburgh, Penna., has been awarded a contract by Laclede Steel Corp. for rebuilding and modernizing the 10 inch skelp mill at their Alton, Ill. plant. Included in the equipment will be new billet handling equipment at the entry side of the furnace, five new roughing mills, a new down and upcut shear, two new edgers, strip handling conveyors and rolls. The mill is expected to be completed and in operation by fall, 1959, and to be capable of producing skelp up to 16 inch width.

Screening Road Wear Test

► Three-T-Fleet, Inc., Odessa, Texas, has inaugurated a low-cost fast screening road test to get a semi-quantitive answer as to whether a new material or new formulation might be suitable for use in tire treads. According to the company, the object of the screening road wear test is to aid the research chemist, research compounder and development personnel to bridge the gap between the point where laboratory tests end and where road tests begin. The purpose of the screening tests is to furnish additional information that will enable the investigator to select the one or two most promising leads for more detailed and exhaustive road tests. The screening test is not a substitute for a road test, but it designed to help in the running of a more meaningful road test when full-scale tests are run.

Laboratories desiring to use the Three-T test will supply the company with laboratory-mixed tread type compounds containing vulcanization, reinforcement, softener and antioxidant ingredients. Three-T testers will take tread sections, have them cold pressed, or plied up from mill sheeted stock, and then used to top cap passenger tires. Tires will be vulcanized in Three-T's own equipment specially designed for the screening test, and they will be tested in a controlled road test.

Unless otherwise specified, half and half treads will be prepared. Each laboratory using this service will furnish a control as well as the experimental half of the tread. According to Three-T, use of half and half construction will help to minimize the effects of wheel position, vehicle idiosyncracies and other determining factors. Where only a very limited amount of tread stock is available, 5.20-13 tires will be used. If a relatively large amount of tread stock can be prepared at low cost, 7.50-14 tires will be tested. The 5.20-13 curing matrix is a special matrix having a skid depth of only 5/32 inch while the 7.50-14 matrix has a standard skid depth of 11/32 inches. The company is using English Morris Minors for the 5.20-13's and Fords or similar light cars for the 7.50-14.

Mold Release Agent

► Air Reduction Chemical Co., a division of Air Reduction Co., Inc., New York, N.Y., has developed "Kyrax A", a hard, water-dispersible synthetic wax, which is reported to be highly compatible with most vegetable, paraffin and bees' waxes. In addition to its use as a mold release agent, some suggested applications are: a component in wood, metal and leather polishes; a component in aerosol wax formulations; a component in paper coatings and textile finishes; and a viscosity increaser and pour joint depressant in lubricating oils.

Walter R. Kosy

Joins Marbon Chemical

► Marbon Chemical, a division of Borg-Warner Corp., Washington, West Va., has announced the appointment of Walter R. Kosy as a technical service representative for Detroit and eastern Michigan. Before joining the Marbon sales force, Mr. Kosy had been with General Industries Co., Elyria, Ohio, and before that, he worked for five years as a project engineer on rubber and plastic problems for the Engineering Division of Chrysler Corp. He also served for eight years with Lyon, Inc., Detroit, Mich., on problems involving control and development of cartridge cases. While at Lyon, he set up a Plastics Department, including a complete laboratory, molding presses, extruders, Banbury and various testing equipment.

Goodrich Appoints Cotton

► George B. Cotton has been appointed manager of technical service at the B. F. Goodrich Footwear and Flooring Co., Watertown, Mass., to succeed William E. Walker, who has retired after 37 years of service with the company. Mr. Cotton graduated from the University of Maine in 1941, with a B.S. degree in chemical engineering and immediately afterwards, joined the B. F. Goodrich Footwear and Flooring Co. as a laboratory chemist. In 1942, he entered the United States Army and returned to the company in 1946 as a technical aide, progressing to technical supervisor; production superintendent, aeronautical; and manager of compounds, special products. He was appointed assistant manager, technical service, on March 1, 1958. He is a member of the American Chemical Society, the Rubber Division of The American Chemical Society, the Boston Rubber Group, and Tau Beta Pi, honorary engineering society of the University of Maine.

Introduces Stock Car Tires

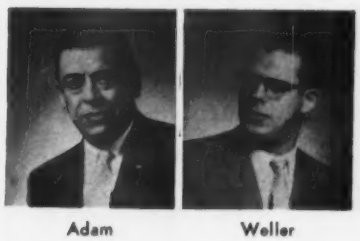
► Goodyear Tire & Rubber Co., Akron, Ohio, is marketing a full line of racing tires for stock car use. The line includes the "Blue Streak Special" for use on high speed asphalt and hard surface tracks; "All-Weather Speedway" for asphalt and dirt tracks, and "All-Weather Raceway" for dirt and loose surface tracks. Made with 3-T nylon cord, the tires feature an exclusive round contour profile and special heat resistant compounds. With a tapered shoulder and wider outer rib, the cornering pressures are spread over a wider tread area instead of being concentrated at one point. This round contour profile cuts down extreme wear in the outer rib area.

Goodyear has developed special racing compounds that contain agents whose sole purpose is to withstand the effect of heat, chief cause of tire separation and porosity, and tabbed the worst of tire killers. Compound "G" is specified for multi-lap and long track races where highest speeds are maintained and heat buildup is greatest, and "R" for medium-speed races on short tracks where exceptional traction is required. All-Weather Raceway and All-Weather Speedway tires are produced in size 7.10/7.60-15, and Blue Streak Special tires are available in that size in addition to the following: 7.50/8.00-14, 8.50/9.00-14, 6.50/6.70-15, and 8.00/8.20-15. Special heavy duty racing tubes are available for all tires.

In conducting its racing tire program, Goodyear maintains headquarters, warehousing and shipping facilities in Dayton, Ohio. The company also operates specially-equipped service vans at trackside for major late model stock car races.

Erie Engine Appoints Three

► Erie Engine & Mfg. Co., Erie, Penna., has appointed Lloyd Adam vice-president in charge of sales and administration, Ray Weller chief engineer and Tom Kramer hydraulics and applications engineer. Mr. Adam has been with Erie for the past 15 years as sales manager. Ray Weller has had over 12 years experience in design and development of rubber and plastics machinery. Tom Kramer, formerly with Aldrich Pump Co., has over 20 years experience with hydraulic systems and controls.



Adam Weller

Bob Coddington

Joins Hartig Extruders

► Bob Coddington has joined Hartig Extruders, Division of Midland-Ross Corp., Mountainside, N.J., as Midwest district sales manager. He was formerly chief engineer for Johnson Rubber Co. and also has served other manufacturers in a development capacity.

Mohawk Rubber Appoints Three

► Mohawk Rubber Co., Akron, Ohio, has announced the appointment of Leighton Riess as manager of compounding and processing. Mr. Riess is assuming the duties of Robert M. Hill who has been named technical manager of Mohawk's Akron plant. Frank M. Johnson, formerly chief chemist at the Akron Plant, has been named chief chemist of the company's Helena, Ark., plant.

Mr. Riess graduated from Pennsylvania State College in 1944 with a B.S. degree in chemical engineering. Previously with Goodyear, he was in the Development Department and served in several of the company's foreign operations. His military service was with Army Ordnance in rocket research and development. Mr. Hill has been with Mohawk since 1957, serving as manager of tire compounding. Mr. Johnson joined Mohawk in 1954 and worked in various phases of development until being named chief chemist in 1958.

Named Assistant Sales Manager

► Charles F. Ashcroft has been named assistant western regional sales manager for Godfrey L. Cabot, Inc., Boston, Mass. Mr. Ashcroft, a native of Pasadena, Calif., attended both Pasadena Junior College and the University of Southern California. He served with the U.S. Army Air Force during the war, and has been actively associated with the rubber industry in both Los Angeles and San Francisco for many years. He is a member of the Los Angeles Rubber Group.

Extend Philippine Rubber Growing

► Extensive growing of natural rubber trees has been started in the Philippines by American rubber companies, which are using a new high-yielding strain developed in Latin America, Malaya and Florida, current reports state. The primary reason for the new development will be to supply raw natural rubber to the three tire factories on the outskirts of Manila, which were completed recently by Goodyear, Goodrich and Firestone, and also to the growing market for raw rubber among the small, chiefly Chinese, manufacturers in Manila.

Political considerations also played a part in the companies' decision to cultivate rubber in the Philippines. Indonesia is torn by civil war, and Ceylon has shifted a growing portion of its trade to Communist China and the Soviet bloc. Newly independent Malaya, with its own problem of Red insurgents, remains the only major producer of natural rubber that promises normal trade with the Western World, it is reported. The largest consumers of raw rubber are the tire factories completed during the last two years by Goodyear, Firestone and Goodrich. Goodyear has a plantation of some 2,400 acres in seedling rubber trees on the Southeast Coast of the Zamboanga Peninsula. This plantation, established in 1928, now is being converted to new high-yielding rubber. Goodrich and Firestone both have started plantations of about 2,500 acres each.

Reeves Appointments Announced

► Vulcan Rubber Products Division of Reeves Brothers, Inc., New York, N. Y., has announced that George West, formerly plant coordinator, has been transferred from the company's New York headquarters to the Buena Vista, Va., plant to become technical manager of development. Mr. West has been succeeded as plant coordinator in New York by Ralph C. Beard, previously industrial engineer at the Buena Vista plant. Mr. West is a graduate of Duke University, where he majored in organic chemistry. Subsequently, he worked as an organic chemist at Duke University on a naval research program. Before joining Reeves Brothers as a plant superintendent, he was a development engineer with the Dayton Rubber Co., Waynesville, N. C. Mr. Beard, who has a B. S. degree in industrial engineering from Virginia Polytechnic Institute, Blacksburg, Va., was production supervisor and project engineer for the Hercules Powder Co. before he joined the company.

► Kingsbacher-Murphy Co. has moved its manufacturing plant general offices to 9830 Bellanca Ave., Los Angeles 45, Calif. The telephone number is Spring 6-1180.

Develops New Rubber Chemical

► A high activity antiozonant-antioxidant, has been developed by the Goodyear Tire & Rubber Co., Akron, Ohio, to impart long term weather protection and heat aging resistance to rubber products, especially tires. Now used by the company in the manufacture of all lines of tires and tread rubber for recapping tires, this rubber chemical is considered unusual in that it serves a dual purpose role, providing protection against both oxidation and ozone. According to Goodyear, the new chemical gives superior resistance to sidewall checking and cracking; protects against heat and flex, or fatigue, and helps rubber retain its tensile strength.

This material is not applied to tires as a protective coating or veneer, but is an inherent part of all Goodyear tire compounds. All tread rubber produced by Goodyear for recapping tires incorporates the new antiozonant-antioxidant with the same beneficial results, Goodyear claims. An additional benefit, particularly to recappers, is that this unvulcanized tread rubber is now more resistant to deterioration and can be stored for much longer periods of time before use.

IBEC Acquires Akron Firm

► International Basic Economy Corp., New York, N.Y., has acquired the Sinclair-Collins Valve Co., Akron, Ohio. The company is a major manufacturer of control valves for steam, air, liquid and gas which are used extensively in the rubber, plastic and plywood industries. Sinclair-Collins is the second Akron firm to be acquired by International, the first being the Bellows Co., in 1957, producers of pneumatic, hydraulic and electrical equipment. Herbert B. Link, president of Bellows, now a division of International, will serve as president of Sinclair-Collins, which will be another division. W. F. Kruspe, vice-president of the valve firm and its affiliated company, Valvair Corp., will be executive vice-president in charge of operations of the new division. J. E. Collins, founder of the company, and an inventor and development engineer, will serve in a consulting capacity.

German Affiliate In U.S.

► United Ultramarine & Chemical Co., an affiliate of Vereinigte Ultramarin Fabriken A.G. of Cologne, West Germany, has established operations in the U. S. and will market a full range of ultramarine blue pigments and allied chemicals manufactured by the parent company. The concern has its executive offices at 149 Broadway, New York, N. Y., and sales agents and warehouses throughout the U. S. and Canada.

How to Protect Product Quality

High-speed operations in the rubber industry require fast, accurate control of tensions. Improper speed matching can ruin the product in process. To help protect product quality, General Electric has designed a new packaged, adjustable-speed drive—the Speed Variator.

Operating from an a-c power source, the Speed Variator provides accurate control of drive speeds over an infinite range.

To find out how this flexible new drive can help you meet today's fast changing process demands, call your General Electric Sales Engineer, or write for GEA-6643. *Direct Current Motor & Generator Department, Erie, Pennsylvania.* 813-22

Progress Is Our Most Important Product

GENERAL ELECTRIC

5 REASONS WHY YOU SHOULD BUY—

New General Electric Speed Variator

1. Amplistat Regulator offers better speed regulation and adjustable, timed acceleration for improved product quality.

2. Static Exciter, with silicon rectifier, has no moving parts, requires no warm-up, provides more production time, less maintenance.

3. Two-Unit, Four-Bearing M-G Set features Tri-Clad† '55' motor for more dependable performance.

4. Front-Connected Controls, recessed wiring troughs make routine inspection easy, cut maintenance time.

5. Kinamatic* Drive-Motors provide instant response to control signals. For details on this fast-acting motor see next page.

For more information contact your Apparatus Sales Office or write for GEA-6643. *Direct Current Motor & Generator Department, Erie, Pennsylvania.*

In Canada, contact Canadian General Electric, Peterborough, Ontario.

† *Registered Trade Mark General Electric Co.*
* *Trade-Mark of General Electric Co.* 815-9

GENERAL ELECTRIC

More On Kinamatic Motors

NEW GENERAL ELECTRIC DC MOTOR GIVES

Instant Working Power

KINAMATIC* . . . a new standard in industrial direct current motors . . . designed to deliver drive power at the moment you need it!

Split-Second Response . . . larger air gaps reduce electrical time constants . . . smaller armature diameter permits more rapid delivery of torque to load . . . means faster starts, stops, reversals.

Low Inertia Armature is dynamically balanced, banded with steel and glass . . . gives dependable, high-speed operation . . . skewed armature slots minimize torque pulsation, permit smooth machine operation at low speed.

Other Power Packed Features of new d-c Kinamatic motors help give you more continuous, more automatic production . . . economically.

Additional information is available at your nearest General Electric Apparatus Sales Office. Or, if you prefer, write for Bulletin GEA-6355. *Direct Current Motor and Generator Department, Erie, Pennsylvania.* 813-9

*Trade-Mark of General Electric Company.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Our Technical Service Laboratory Will Help You Build Better Products With Neville Resins

If you are not already using Neville coumarone-indene resins in the manufacture of your rubber products, it will pay you to request the assistance of our Technical Service Laboratory. Our chemists will work with yours in choosing the exact grade to suit your need. Neville coumarone-indene resins are ideal extender-plasticizers. They aid processing and add tensile strength and durability to finished compounds. Write for details.

Neville Chemical Company, Pittsburgh 25, Pa.

Resins—Coumarone-Indene, Heat Reactive, Phenol Modified Coumarone-Indene, Petroleum, Alkylated Phenol • **Oils**—Shingle Stain, Neutral, Plasticizing, Rubber Reclaiming • **Solvents**—2-50-W Hi-Flash*, Wire Enamel Thinners, Nevsolv*.

*Trade Name ®

NEVILLE®

Please send information on Neville Chemicals.

NAME TITLE

COMPANY

ADDRESS

CITY STATE

NC-11-RA

West Coast News

► Ross E. Morris, of the Mare Island Rubber Laboratory, was guest speaker at the November 13 dinner meeting of the Northern California Rubber Group, which was held at the Berkeley Elks Club, Berkeley, Calif. In his discussion on "The Effect of Nuclear Radiation on Rubbers", Mr. Morris was concerned with the effects of radiation damage to rubber items in the vicinity of nuclear reactors. He pointed out that the effects of neutrons and gamma radiation on rubbers are apparently the same when equal energies of each are absorbed.

Nuclear radiation forms free radicals, or possibly, ions in rubbers which react to form more cross-links in rubber vulcanizates or to depolymerize them. Various investigators have shown that cross-linking predominates in most rubbers. Butyl and Thiokol rubbers were cited as examples of rubbers which are depolymerized by nuclear radiation. According to published information, Mr. Morris said, the vulcanized rubbers which have the best retention of tensile properties are natural, styrene-butadiene and acrylonitrile-butadiene in the order named.

Mr. Morris described the work carried on in his laboratory on the effect of gamma radiation on the compression set of the various vulcanizates, and stated that all samples tested to date suffered 100 per cent compression set when subjected to 10^6 roentgens. However, some of the vulcanizates had compression sets as low as 60 per cent when exposed to 10^6 roentgens. All samples were exposed while compressed. He said that the best rubbers in this respect were urethane, styrene-butadiene and the carboxylic derivative of the latter. Five parts of certain antioxidants were beneficial to a small degree. Also, certain plasticizers reduce compression set slightly. The goal set for the project is a vulcanizate having less than 100 per cent set after 10^6 roentgens. The speaker expressed doubt that this goal will be reached with presently available materials.

The final session of a series of six weekly education seminars, sponsored by the Northern California Rubber Group, was held on Wednesday, November 12. B. S. Garvey (Pennsalt) was moderator on the subject of "Accelerators and Vulcanizing Agents." The seminars consisted of introductory lectures by moderators followed by question and answer sessions during which specific compounding difficulties were discussed.

The preceding seminars were "Statistical Control Testing," moderated by C. A. Stephens (Federal Mogul-Bower Bearings); "Special Elastomers," by B. W. Fuller (DuPont) and R. B. Stewart (Dow Corning); "Hydrocarbon Plasticizers and Softeners," by D. M. Preiss (Shell Oil); "Reclaimed Rubber," by M. A. McDonald (Midwest Rubber Reclaiming); and "Antioxidants and Antiozonants," by John Eynck (Mare Island Naval Shipyard).

The group recently announced nominations for 1959 officers and directors and new officers were to have been installed at the Annual Christmas Party, which was scheduled for 7:30 p.m. on December 6, at the Orinda Country Club, Orinda, Calif.

Harold D. Bond

► E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has named Harold D. Bond as a western technical sales representative for the Elastomer Chemicals Department. He will be headquartered in Los Angeles and will serve customers in Southern California, New Mexico, Arizona and Nevada. Mr. Bond joined DuPont in 1953, working on metering and mixing equipment for urethane foam in the company's rubber laboratory. He also did sales promotion work in the Wilmington, Del., office and worked in the elastomers sales service laboratory. Prior to joining DuPont, Mr. Bond was with the Douglas Aircraft Co., North American Aviation, Inc., Lockheed Overseas Corp. and Pratt-Whitney Aircraft. He is a member of the American Society of Mechanical Engineers and a mechanical engineering graduate of Louisiana Polytechnic Institute.

► E. W. Shaw has been named purchasing agent for the Los Angeles plant of the B. F. Goodrich Co., succeeding Larry Finley, who has been transferred to the Akron office.

► The Los Angeles Rubber Group, Inc., was to have held its Annual Christmas Party on Friday, December 12 at the Grand Ballroom and the Caribe Lounge of the Beverly-Hilton Hotel in Los Angeles. The party was to have included a social hour, dinner, dancing and a show. During the evening the group planned to introduce new officers and directors for 1959.

A list of candidates for officers and directors, submitted by the group's nominating committee, included *Chairman,* Charles H. Kuhn (Master Processing); *Associate Chairman,* B. R. Snyder (R. T. Vanderbilt); *Vice-Chairman,* W. M. Anderson (Gross Manufacturing); *Treasurer,* Lawrence W. Chaffee (Ohio Rubber) and Howard R. Fisher (W. J. Voit); and *Secretary,* Charles M. Churchill (Naugatuck Chemical) and Carl E. Huxley (Enjay).

Three directors were to have been elected from the following: A. J. Hawkins, Jr. (DuPont); W. A. Ireland (Firestone); Thomas B. Keenan (Plastic & Rubber Products); A. P. Marone (Witco Chemical); John H. McSparran (Koppers); L. E. Peterson (Goodyear); Harold W. Sears (Stillman Rubber); Joseph J. Stetina (Tri-Angle Tool & Machine Works); and R. O. White (Caram Manufacturing).

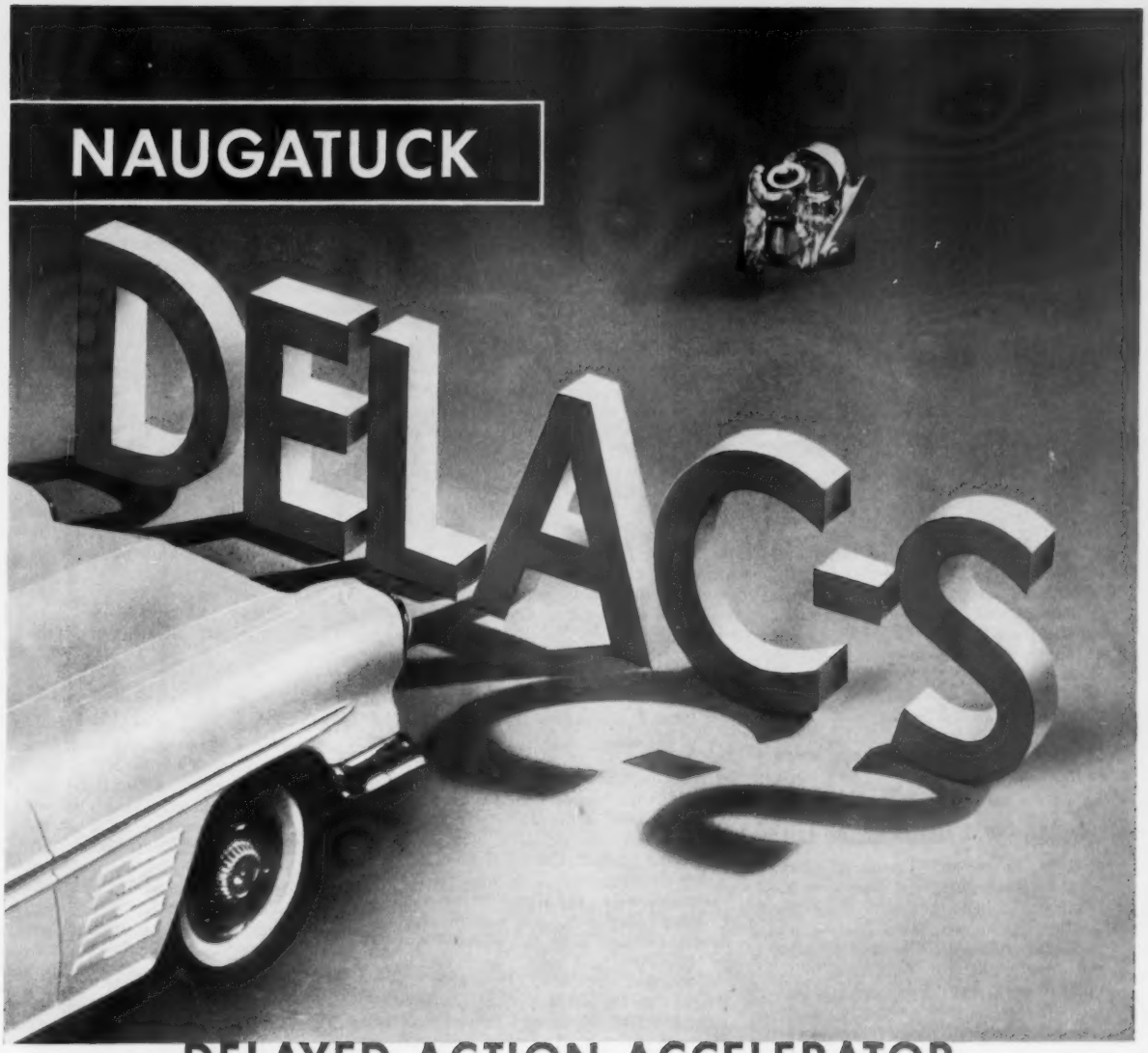
The nominating committee consisted of Carl Hoglund, Charles Kuhn, F. C. Johnston and L. E. Budnick.

A new feature of the Annual Christmas Party was to have been a draw prize, instead of the usual ladies' favors, for which anyone who had purchased a ticket would be eligible. A $1000 gift certificate from a well-established travel agency and $200 in cash for incidental expenses was the prize slated for the winner. The travel agency was to have helped the winner make the necessary arrangements for his selected dates. The certificate may be used any time in 1959. The Prize Committee advised that the winner of this Hawaiian trip would be subject to the normal tax obligation.

The committee had also planned to present to each lady, as she entered, with an appropriate corsage.

During the group's November 4 meeting, the Tlargi board of directors accepted several new members, including Daniel E. Lukach (Midwest Rubber Reclaiming); Fred A. Benson (Silicone Engineering & Manufacturing); Isaac Drogin (United Carbon); Donald Simonds (Godfrey L. Cabot); William P. Ball (W. J. Voit); Henry F. Palmer (Kirkhill Rubber) Ben Levin (Molded Rubber Specialties); and Kenneth D. Champagne (Western Insulated Wire).

Winners at the November meeting were: *Reservation Card Prize,* Bob Dougherty (U. S. Rubber); *Draw Prizes,* H. R. Nebeker (Shell Chemical); Joe Shlosberg (Western Insulated Wire); Bert Dougherty (B. E. Dougherty); and Ross Mirolla (Plastic & Rubber Products).



DELAYED ACTION ACCELERATOR

fast acceleration...when you want it

The growing use of the more scorchy furnace blacks and increasing demand for faster curing cycles pose an industry-wide problem. The answer is Naugatuck's DELAC-S delayed action accelerator.

The most stable of the sulfenamide accelerators, DELAC-S may be used as the sole accelerator, with full scorch safety and a curing time less than that of other delayed action accelerators. Or it may be compounded with Retarder J or with activators to give precisely the combination of processing speed and safety your particular operation requires.

An important additional advantage of DELAC-S is its relatively low cost. DELAC-S is available in mixed ton or truck shipments with Naugatuck Thiazoles. For more information on this new Naugatuck delayed action accelerator, write the address below today.

Naugatuck Chemical

Division of United States Rubber Company 1222 R Elm Street Naugatuck, Connecticut

US RUBBER

Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices • CANADA: Naugatuck Chemicals Division, Dominion Rubber Co., Ltd., Elmira, Ontario • CABLE: Rubexport, N.Y.

Three Girdler Appointments

► James T. Bradbury has been named supervisor of the Research Section and Robert F. Vance, supervisor of the Development Section for the Research and Development Department of Girdler Catalysts, Louisville, Ky., according to the Chemical Products Division of Chemetron Corp. The company has also announced the appointment of Francis J. O'Hara as supervisor of Girdler's Analytical Laboratory.

Mr. Bradbury was graduated from the University of Kentucky in 1953 and received a master's degree from California Institute of Technology in 1956. Following summer work with Girdler Catalysts, while a student at Kentucky, he joined the company on a full time basis in 1955. Mr. Vance was graduated from Otterbein College in 1949, received his master's degree in 1950 and his doctorate in inorganic chemistry in 1952 from the University of Illinois. He was associated with Battelle Memorial Institute from 1952 to 1958, when he joined Girdler Catalysts. Mr. O'Hara was graduated from the University of Louisville in 1949 and did post graduate work in chemistry there the following year. He had studied engineering at Northwest Missouri State College prior to service in the United States Navy.

Javatex Molding Latex

► Java Latex and Chemical Corp., New York, N. Y., reports that it has developed a new, one-part latex that requires no messy batter mixing and produces molds that are accurate to the minutest details. According to the company, Javatex Molding Latex is a self-vulcanizing, milky-white liquid. No catalytic agents or accelerators are required for drying or curing molds made with this material, which may be applied by brush, spray or hand dipping, depending upon the nature of the object to be molded and the type of mold to be made. The company claims that molds made with Javatex may be used in the manufacture of religious statuary, toys, novelties, sports equipment, lamps, mannequins, artificial limbs, rubber masks, dolls, artificial jewelry, and a variety of rubber, plastic and ceramic products.

Degen Forms New Firm

► Degen Oil & Chemical Co., Jersey City, N.J., is a new corporation which has been formed to process industrial vegetable oils and resins for rubber, paint, ink, petroleum and textile oil manufacturers. Officers of the new firm are: George F. Degen, president; Robert A. Pollock, vice-president in charge of production; and Paul H. Feakins, vice-president in charge of sales. Distribution of the firm's products will be handled by George Degen & Co., New York, N. Y.

Canadian News

► Dominion Royal Tires, Dominion Rubber Co., Ltd., Montreal, Que., has appointed J. D. Ferguson trade sales manager, and L. F. Vauthier sales manager, special accounts. Mr. Ferguson, who joined the tire division in 1946, was assistant tire sales manager up to the time of his current appointment. He will direct sales activities of Dominion brand tires through the company's branch and distributor organizations across Canada. Mr. Vauthier has been associated with the tire division for 34 years, having served as tire sales manager, Quebec Division, and as sales manager of Dominion Tires.

► Polymer Corp. Ltd., Sarnia, Ont., Canada, has announced the construction of additional storage facilities for rubber for shipment. The new structure, located on Churchill Road near Scott Road in Sarnia, is expected to be completed by the spring of 1959, and will cost in excess of $500,000. The facility will consist of two sections, each approximately 450 feet long by 200 feet wide. Railway track between the sections will provide for car loading, and docks for loading of highway transports are also planned.

► Dow Chemical Co. of Canada has introduced a new line of high-density polyethylenes to the Canadian market. Pending completion of a new plant at Sarnia, Ont., in 1959, the material will be imported and sold to Canadian molders and extruders. Dow also has started on an active market development program for the new polyethylene material. Currently, major applications for high-density polyethylene are containers for both industrial and household products, housewares, toys, bottles, film for use in packaging a wide variety of products, and pipe.

► The board of directors of Polymer Corp., Ltd., Sarnia, Ontario, held a meeting on October 30, 1958, and inspected the new addition to the research and development laboratory at the Sarnia plant, the new latex plant and the recently completed seventh copolymer finishing line. E. J. Brunning, chairman of the board expressed satisfaction with these units and declared that the new facilities are an indication of Polymer's determination to maintain its program of product development and output of a wide range of quality rubbers.

► Gutta Percha and Rubber, Ltd., Toronto, Ontario, has appointed G. S. Guthrie as Quebec divisional manager with headquarters in Montreal. Mr. Guthrie formerly was sales manager of the Central Division in Winnipeg, Manitoba.

Firestone Profit Cited

► The Government Accounting Office has charged Firestone Tire & Rubber Co., Akron, Ohio, with making an "unreasonably high" rate of profit: 35 per cent of cost on a three year Defense Department contract. The charge was made in a report to government operations committees of the House and Senate. Firestone claims its net profit on the contract, making aircraft fuel cells on subcontract to Boeing Airplane Co. and Lockheed Aircraft Corp., averaged "under 11 per cent." The company said that the accounting office report considered only a selected period and was not representative of the entire operation. The contract examined by the accounting office covered a three year period ending in October, 1956. In that period, according to the accounting office, Firestone earned a profit of about $3 million on the fuel cells. A Firestone spokesman stated that all of their government contracts are renegotiable and have always been settled to the full satisfaction of the government.

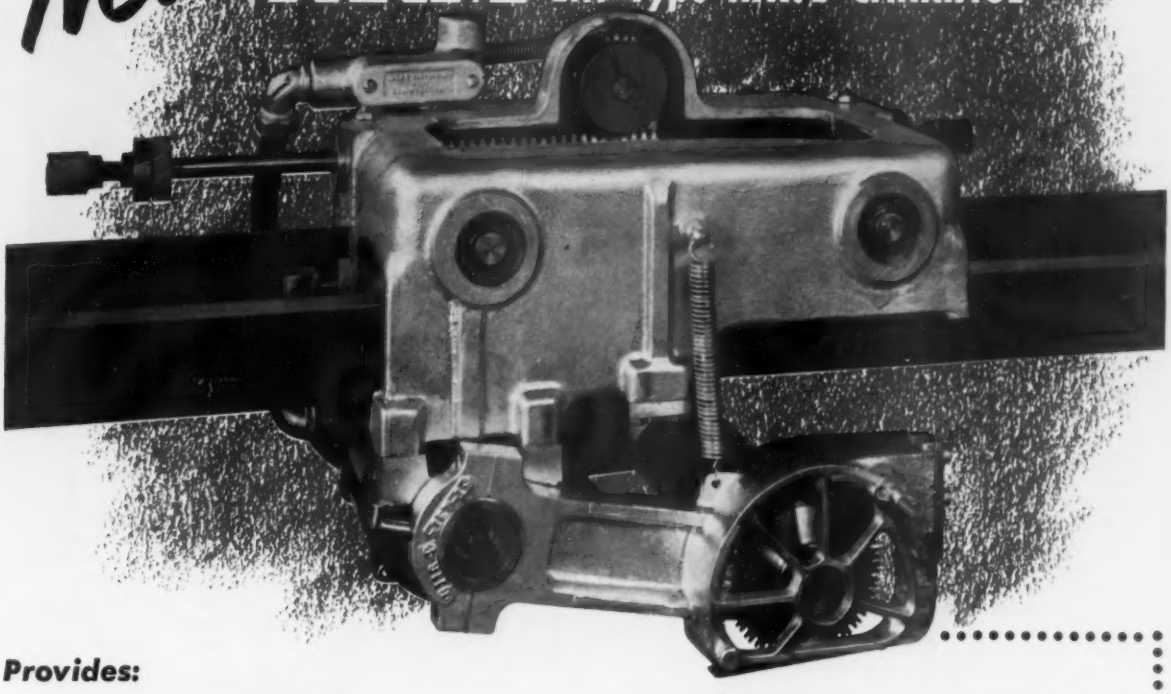
Mixing Rubber Into Asphalt

► A new method for mixing rubber into asphalt for resurfacing highways has been announced by the Xylos Rubber Co., a subsidiary of Firestone Tire & Rubber Co., Akron, Ohio. The new method, the company reports, is the easiest method of blending the materials for resurfacing highways with rubberized asphalt. A liquid, called "Rub-R-Road Compound R-524," is poured into a truckload of asphalt and may be blended right on the job. The rubberized asphalt is then sprayed from the truck onto the pavement. According to Xylos, most other systems necessitate the mixing of rubber and asphalt before it is loaded into the tank truck. The Xylos compound is a ready-to-blend liquid and does not require boiling off of water. The company reports that all the compound needed to rubberize the asphalt required for the surface treatment of one mile of a 24 foot wide highway can be carried in three 55 gallon drums.

British Product Group Formed

► The leading companies in Great Britain, specializing in rubber and ebonite industrial plant linings, have formed a new product group within the Federation of British Rubber and Allied Manufacturers. The object of the group will be to collect statistics of work done in industrial installations of all kinds; to exchange and coordinate technical information on the application and use of natural and synthetic rubber and ebonite linings; and to promote a wider understanding in the industrial community of the versatility of rubber and ebonite linings, and their efficacy as protection against the majority of corrosive and abrasive materials in modern use.

New NRM BIAS CUTTER
Lift Type KNIFE CARRIAGE



Provides:

MORE CUTS PER MINUTE — This new-type knife carriage is designed especially to increase speed of fabric cutting, to be easily installed on existing NRM Bias Cutters, and to require minimum maintenance. A 1/2 HP, 3600 RPM motor drives the 1/32" thick x 3-3/4" dia. knife at 9,000 RPM, to provide up to 27 cuts per minute on NRM machines of latest design, and to substantially increase cuts per minute when installed on older machines.

LESS MAINTENANCE — Rigid mounting of motor to bottom of carriage, and compact, lightweight design of the hinged knife spindle, make operation smooth and trouble-free. Chances of "ball-ups" on carriage return strokes are eliminated by a mechanism which raises the knife clear of the fabric when carriage is returned. Bias cutter knives can be changed quickly for regrinding without use of tools. No pneumatic or additional electric controls are required.

QUICK INSTALLATION — Only minor changes are required in the field to adapt the new-type cutter carriage to your present NRM Bias Cutter. Details and specifications sent on request.

UP TO 27 CUTS PER MINUTE

NO PNEUMATIC OR ADDITIONAL ELECTRIC CONTROLS REQUIRED

QUICK KNIFE CHANGING WITHOUT TOOLS

Contact us for performance details and specifications on NRM bias cutters.

NATIONAL RUBBER MACHINERY COMPANY

NRM

Creative Engineering

General Offices and Engineering Laboratories: 47 West Exchange St., Akron 8, Ohio
WEST: S. M. Kipp, Box 441, Pasadena 18, Cal.
EXPORT: Gillespie & Company, 96 Wall St., New York 6, N. Y.

Obituaries

Victor L. King

► Dr. Victor Louis King, a chemical engineer and former technical director for the Calco Chemical Division of the American Cyanamid Co., died on October 12 at his home in Bound Brook, N. J. He was 72 years old. Since his retirement from American Cyanamid in 1957, he had been vice-president of Rhodia, Inc., New Brunswick, N. J.

Dr. King was graduated from Dartmouth College in 1907. Later, he attended the Columbia University School of Mines and also received doctorates in chemistry, summa cum laude from the University of Zurich, Switzerland, and the Swiss Polytechnic Federation. He had studied under Dr. Albert Einstein and other noted scientists. Before he joined Calco in 1919, he had served enterprises conducted by August Heckscher, Thomas A. Edison and August Belmont. He had also been associated with the Charles Pfizer & Co., and had been operations superintendent for Hoffman-La Roche in Germany.

Actively engaged in several phases of the chemical field, Dr. King was chairman of the Dye Section of the War Industries Board headed by Bernard M. Baruch, during World War I. He played an important role in developing the dye industry in this country, and also held chemical patents in the field of antibiotics. He had built, staffed and operated chemical plants in Europe, Asia, and the United States, and was noted for his work on processes for sewage treatment and the prevention of air pollution. When World War II ended, Dr. King headed a team of United States chemical manufacturers who went to Europe for the Department of Commerce. He was a founding member and former officer of the American Institute of Chemical Engineers. Surviving are his wife and four sons.

Albert L. Ely

► Albert Love Ely, formerly patent counsel for the Firestone Tire and Rubber Co., and senior partner in his own Akron law firm since 1921, died on October 21 at City Hospital, Akron, Ohio. His death closed a 48 year career in the field of patent, trademark and copyright law. Mr. Ely began his career as an examiner in the U. S. Patent Office in 1910, while he was a student at the George Washington University Law School, Washington, D. C. He joined Firestone's legal Department in 1915. Six years later, he helped to found the patent law firm of Ely, Frye and Hamilton, through which he continued to handle much of Firestone's patent work. He is survived by his wife and two sons.

Brack B. McHan

► Brack B. McHan, vice-president and director of research for the Calcium Carbonate Co., Quincy, Ill., died on October 7 in St. Marys Hospital in Quincy. Mr. McHan was widely known in the feed and chemical fields and under his direction, the wet process for adding iodine to calcium carbonate was developed. Before he joined the company, he was research director for the Sears Roebuck Co. in Chicago, and before that, he did research for the Buckeye Incubator Co., Dayton, Ohio. During World War I, as a chemical engineer, Mr. McHan designed and built the explosion plant for the General Explosion Co., Joplin, Mo. Born in West Plains, Mo., he studied chemistry at Idaho University. He was a member of the American Chemical Society and several other organizations.

Archie P. Eves

► Archie P. Eves, who was formerly a chemist for the Gillette Rubber Co., Eau Clair, Wisc., a concern that is now a part of the U. S. Rubber Co., died recently in Watsonville, Calif., after a brief illness. He was 82 years old. Mr. Eves, a native of Akron, attended old Buchtel College, now the University of Akron. He studied chemistry and metallurgy and after graduation in 1900, he became a chemical-metallurgical researcher for the old International Harvester Co. plants in Akron. When the company moved to Chicago, he moved there with it. Later, he joined Gillette Rubber. Mr. Eves retired seven years ago and spent his retirement in Watsonville, Calif. He is survived by his wife and a son.

Joseph L. Sturtevant

► Joseph L. Sturtevant, treasurer and former president and chairman of the board for the Sturtevant Mill Co., Dorchester, Mass., died on October 16, at the Massachusetts Memorial Hospital, Boston, Mass., after a long illness. He was 84 years old. Mr. Sturtevant was a graduate of the Massachusetts Institute of Technology and spent his early life in Framingham, Mass. Previous to his association with Sturtevant Mill, he was the owner of the Thayer Drug Co. He is survived by his wife.

Christian T. Haag

► Christian T. Haag, retired superintendent of the Hose Division of the U.S. Rubber Co., Passaic, N. J., died on October 6 in St. Mary's Hospital after a three week illness. Mr. Haag was 70 years old. Surviving are his wife, two sons and a daughter.

Stefano Oberto

► Dr. Stefano Oberto, a member of the Research and Development Committee and operation research director for Pirelli S. p. A., Milan, Italy, died on October 3 of a heart attack. He was 51 years old. A fellow of the Institution of the Rubber Industry, Dr. Oberto was a distinguished rubber technologist. After his graduation, he joined the Pirelli Rubber Laboratories and remained with that firm with the exception of a span of seven years after 1939, when he entered the then new Italian synthetic rubber industry. There, he first acted as process instrumentation designer and later as a research director.

Most of Dr. Oberto's published work deals with rubber physical testing methods including heat of vulcanization, relation between fluorescences and vulcanization, and optical anysotropy of vulcanizates. His hobby was small scale testing and he had designed micro-hardness and micro-rebound apparatus and was working on this just before his death. Dr. Oberto also experimented in rubber polymerization and compounding which led him to a keen interest in statistical applications in research, production and management. An active member of ISO/TC 45, he made many contributions to international rubber standardization work.

Adolph H. Thye

► Adolph H. Thye, industrial engineer for the B. F. Goodrich Co., Akron, Ohio, died on October 5 in the Marietta Memorial Hospital Marietta, Ohio, after a heart attack. He had been ill about a year. Mr. Thye, a native of Eldred, Penna., became a resident of Akron in his youth and attended South High School there. He joined Goodrich 34 years ago and in 1947, he was transferred from Akron to Marietta as staff manager of the Plastics Division. Mr. Thye was a member of Akron Lodge 517, F. & A. M., the Columbus Shrine and Concordia Lutheran Church. He is survived by his wife and two daughters.

SOLUTIONS TO YOUR COMPOUNDING PUZZLE...

New Polyurethane-type rubber

GENTHANE-S

Consider these advantages of products derived from this stock

- VERY GOOD OZONE RESISTANCE
- EXCELLENT OIL RESISTANCE
- REMARKABLE HEAT RESISTANCE
- OUTSTANDING ABRASION RESISTANCE

If you're looking for rubber stock with unique qualities to solve tough product requirements, Genthane-S may offer an easy solution to your problem. Combining excellent ozone, oil, heat and abrasion resistance with ability to be processed on existing equipment, this stock has numerous applications in specialty-compounding . . . for example, industrial tires, footwear, valve diaphragms, impellers, grommets and oil field supplies. Genthane-S polyurethane elastomer is available in semi-commercial quantities now. Send for a sample shipment and complete literature today!

THE GENERAL TIRE & RUBBER COMPANY

CHEMICAL DIVISION, DEPT. A

AKRON, OHIO

Creating Progress Through Chemistry

Chemical Division GENERAL

THE GENERAL TIRE & RUBBER CO

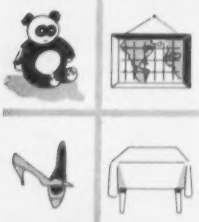
ENDURA

takes pride in it's . . .

PROVEN ABILITY

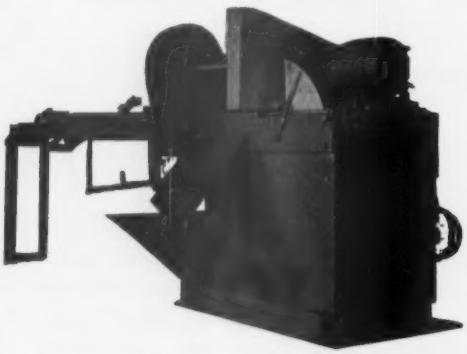
to "toughen up" paper . . . . make it more durable, flexible and adaptable for a wide variety of uses.

ENDURA is the leading supplier to the pressure-sensitive tape industry. It pioneers many of the technical advances in this field.
Its facilities, resources and technical know-how are always available for new ideas.



ENDURA® Impregnated and Coated Papers
Quakertown 27, Pa.

SLICER MACHINE
for
EXTRUDED STOCKS



Capacity Section up to 4" OD or 4x6" flat stock.
Length 3/16" to 8".
Cuts per minute 25 to 175.
Automatic Feed and Circulating Pump.
Made in three sizes.

UTILITY MANUFACTURING COMPANY
Cudahy, Wisconsin
Write Today for Complete Information

New Goods

All-Weather Rubber Boot

► A boot made out of conventional rubber for ordinary water or snow service or neoprene synthetic rubber for use when grease, oil, barnyard acids, or chemicals might be encountered is being produced by the Tingley Rubber Corp., Rahway, N. J. It is molded in one piece and has no fabric lining. An "air-conditioning" action results from the design which produces a bellows-like effect

with every step. Ridges molded inside assure ventilation and circulation of air. A button and strap, molded as part of the boot, provide easy closure, and the boot will stretch to fit over any shoe within each size range. The neoprene boot is recommended for heavy-duty, outdoor wear because of its abrasion resistance and ability to withstand the effects of sunlight, ozone and weather. Men's boots are 10 inches high and are made in four sizes to fit any shoe from 6½ to 13. Boots for children and youngsters are also available.

Pace Upholstery Fabric

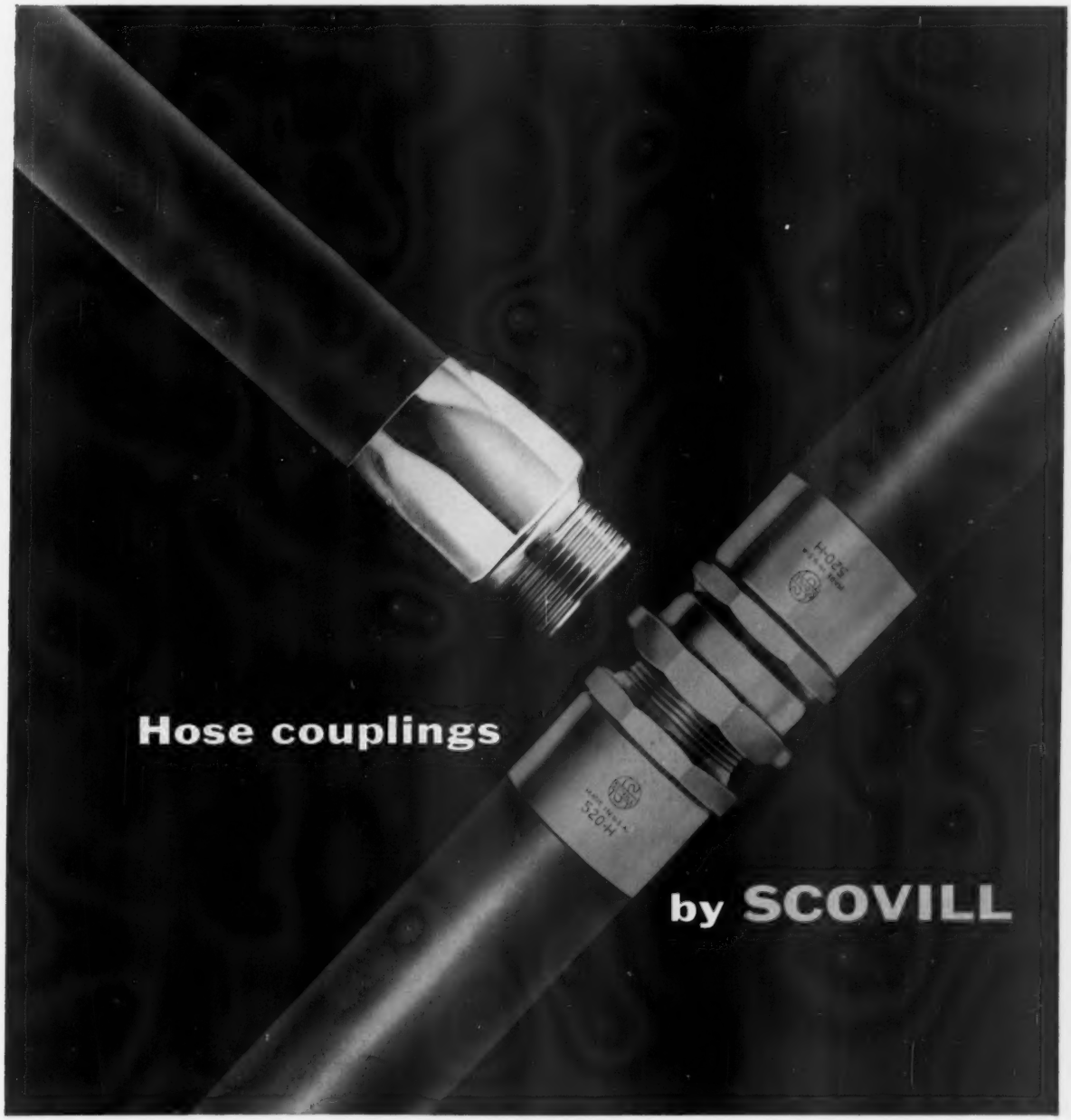
► U. S. Rubber Co., 1230 Avenue of the Americas, New York, N. Y., is introducing a new line of upholstery with vinyl designs anchored to a soft woven fabric. Made in the company's Stoughton, Wisc., plant, the new upholstery is called "Pace" and features a non-repeat random vinyl design on fabric with a silver print accenting the pattern. According to the company, the fabric has a woven look, is porous, soft and comfortable in feel, easy to tailor and can be cleaned with a damp cloth. The soft woven fabric is made with a new manufacturing process in which it is reinforced with a special protective vinyl coating that is said to provide color-fastness and resistance to soiling. The modern random vinyl pattern in Pace, is then permanently fused to the fabric with silver print as an accent, the company states. Pace is produced in ten colors including tangerine, sandalwood, green olive, shadow gray, antique white, sand, mustard, ginger, espresso and cerulean.

New way to cut costs, increase profits:
PERMANENTLY-ATTACHED HOSE COUPLINGS

Scovill's permanently-attached fuel oil and gasoline pump hose couplings can save you money by eliminating the unnecessary... the **hidden**... costs of re-attachable couplings. These unseen costs include such expenses as removal-time of old hose couplings, storage, shipping, paper work, re-attachment, and many more.

Hidden costs added to the **higher initial cost** of re-attachable couplings mean one thing: it will actually cost you **less** to throw away a used Scovill permanently-attached coupling than to recondition a re-attachable coupling for re-use.

It's easy to see Scovill permanently-attached couplings save **all along the line.** For full details on the advantages and savings of modern permanently-attached hose couplings write: Scovill Manufacturing Company, Hose Coupling Department, Waterbury 20, Connecticut.



SYNPOL
TEX US
TEXAS-U.S. CHEMICAL COMPANY
PORT NECHES, TEXAS

Which of these
7 NEW SYNPOLS
can benefit you most?

During the past year, TEXUS has introduced a variety of new SYNPOL SBR rubbers that have already proved their worth to many rubber processors. These same rubbers could be of extreme value to *you*. Compare the properties your product now has or needs with the advantages these new rubbers offer:

SYNPOL 8000 Containing nearly twice the normal amount of styrene (43 parts per hundred), this new hot-type, non-staining, non-discoloring rubber provides premium-rubber properties at a standard-rubber price. With high green strength and excellent flow characteristics, it is ideal for many calendered goods, adhesives, closure and sealing compounds, and molded goods.

SYNPOL 8200 An extremely light-colored polymer, this new SYNPOL is a significant addition to the widest line of clear polymers in the industry. With 37.5 parts of pale naphthenic oil, it has a low ash content, is non-staining and non-discoloring. It offers a host of colorful product-improvement and new-product possibilities.

SYNPOL 8201 offers substantial new economies in light-colored rubber products. Extended with 50 parts of naphthenic oil, non-staining, non-discoloring 8201's low ash content recommends it for low moisture absorption applications. It provides both color *and* economy for car carpets, floor tiles, and a wide range of such products.

SYNPOL 8150 (Black Masterbatch) Here is one of a group of mechanically mixed, ultra-dispersed black masterbatches—the first and only such masterbatches commercially proved and now being produced on a full commercial scale. With 50 parts of HAF, SYNPOL 8150 offers the general properties of SBR 1600, with significant improvements. Equivalent to premium rubbers in low ash content, it offers a combination of mixing economies and rubber toughness ideal for premium-quality tire treads and other products calling for maximum wear resistance.

SYNPOL 8250 (Black Masterbatch) Containing 50 parts of HAF black, with 25 parts of highly aromatic oil and a mixed fatty acid-rosin acid emulsifier, this new black is particularly well suited for camelback and other such products where the economy of oil-extension is a basic consideration.

SYNPOL 8251 (Black Masterbatch) 75 parts of HAF black, with 37.5 parts of highly aromatic oil, make this black masterbatch a natural choice for tire treads, mechanical goods and similar products.

SYNPOL 8253 (Black Masterbatch) Extending the growing line of commercially proved and commercially available ultra-dispersed black masterbatches into other carbon reinforcements, new 8253 contains 60 parts of FEF, with 37.5 parts of naphthenic oil. Since it is non-staining, it is particularly adapted to such products as non-marking soles and heels in addition to tire carcass and sidewalls.

If any one of these new rubbers seems related to your product or process needs, look into it further now. *Whatever* your product, you'll find it pays to keep in touch with TEXUS.

FOR TECHNICAL BULLETINS AND SAMPLES, WRITE US TODAY

TEXUS SYNPOL®

TEXAS-U.S. CHEMICAL COMPANY
260 Madison Avenue, New York 16, N.Y. • MUrray Hill 9-3322
General Offices and Plants: Port Neches, Tex. TEXUS Research Center: Parsippany, N.J.

100% INCREASE IN PRODUCTION
PLUS
50% DECREASE IN LABOR COST

--these are *conservative* figures on what you can expect to gain, molding average parts, with the new, revolutionary--

HOLMES
Hydro-Moldic
trade mark
PRODUCTION MOLDING PRESS

- COMPLETE MOLD ACCESSIBILITY
- FAST STOCK LOADING
- NO MOLD HANDLING
- NO OPERATOR FATIGUE
- NO MOLD MAINTENANCE THROUGH MISHANDLING
- NO HEAT LOSS IN CYCLE CHANGE
- MINIMUM FLOOR SPACE REQUIRED

The new, completely different Holmes Hydro-Moldic Production Molding Press is not only ideal for long runs--but it is particularly suited for short runs too. In small or large plant, it will quickly recover its low, initial cost. It will pay you to send for illustrated descriptive folder--today.

STANLEY H. HOLMES CO.
3300 W. Lake Street
Chicago 24, Illinois

Date.....

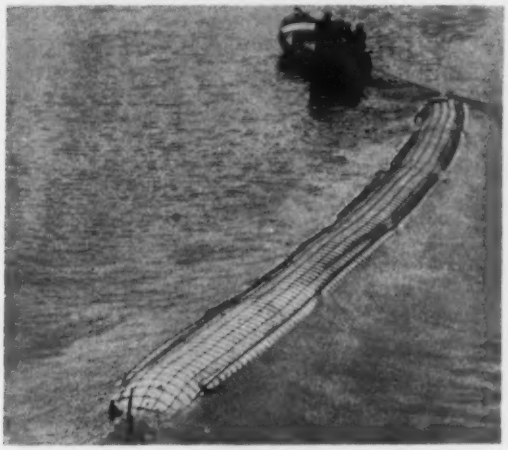
100% increase in production...plus...50% decrease in labor cost--certainly interests me. Without obligating me in any way please send illustrated descriptive folder giving details about the Holmes Hydro-Moldic Production Molding Press.

NAME.....TITLE.....
COMPANY.....
ADDRESS.....
CITY.....ZONE.....STATE.....

Stanley H. **HOLMES** Company
Hydraulic Presses--Since 1901
3300 W. Lake St. Chicago 24, Ill.

Flexible Plastic Barge

► A new type of German flexible plastic barge will be imported and distributed in this country by Reichhold Chemicals, Inc., 509 Madison Ave., New York 22, N. Y. Made of polyvinyl chloride, the floating tubular bags are said to be impervious to corrosion. The barges are towed by power boats and are expected to reduce shipping costs 60 to



80 per cent. Reichhold states that a tubular barge could be produced at a substantially lower cost-per-gallon than a conventional tank barge of equal carrying volume. The company will produce the chemicals for the vessel and also expects to be among the first users. The 100 foot long model already tested at Hamburg, weighs 650 pounds and its skin is 0.03 of an inch thick. Future models are expected to have considerable range in size.

Teflon Coated Conveyor Belt

► Quaker Rubber Division, H. K. Porter Co., Philadelphia, Penna., has introduced a non-stick "Teflon" coated, glass fabric conveyor belt designed to solve the problem of heat and sticky materials in industrial handling. Said to be unsurpassed in its combination of electrical, chemical and physical properties, the new belt incorporates the best qualities of Teflon and fiber glass yarn for lightweight conveyor applications. It will remain flexible and non-brittle over a temperature range of −100 to +525°F. Teflon is not affected by mineral acids, salts or alkalis, and is practically inert to such reagents as boiling concentrated sulfuric acid, fuming nitric acid, boiling saturated sodium hydroxide and all of the usual powerful oxidizing agents. The natural brown color is bleached by strong oxidizing mineral acids. Quaker is offering Teflon coated glass fabric endless single ply belts in either .005 or .010-inch thicknesses, in widths up to 36-inches with a lap splice.

Maggie's DCIsion:
A Merry Christmas
and a
Happy New Year
If we could say it in seven languages
we couldn't make it strong enough.

DARLINGTON CHEMICALS, INC.
1420 Walnut St., Philadelphia 2, Pa.
Represented by • Summit Chemical Co., Akron
• Tumpeer Chemical Co., Chicago
• The B. E. Dougherty Co.,
Los Angeles and San Francisco

For
GASKETS • ASBESTOS • FIBREGLAS • CARDBOARD
HARD RUBBER • FOAM RUBBER • PLASTIC FOAM
SPONGE RUBBER • DIE CUT METAL • FELT • CORK
FIBRE • PAPER • FABRIC • CANVAS • LEATHER

Versatile Schaefer Cementers are practical for latex and solvent rubber cements. Bench machines for short runs and conveyor machines to cement the top side of sheets for production. 8" to 60" wide. Ideal for rubber industry.

Schaefer
MACHINE COMPANY, INC.
135 FRONT ST. • BRIDGEPORT 6, CONN.
Tels. N. Y. City, LE 2-2010 • Boston, HI 3-8006 • Bridgeport, TO 6-2250

AMES

...the preferred Dial Comparators...

No. 2W Dial Comparator

Dimensional checking is fast, easy and accurate with Ames Dial Comparators. You get definite, impersonal readings right from the dial. There's no guesswork or figuring.

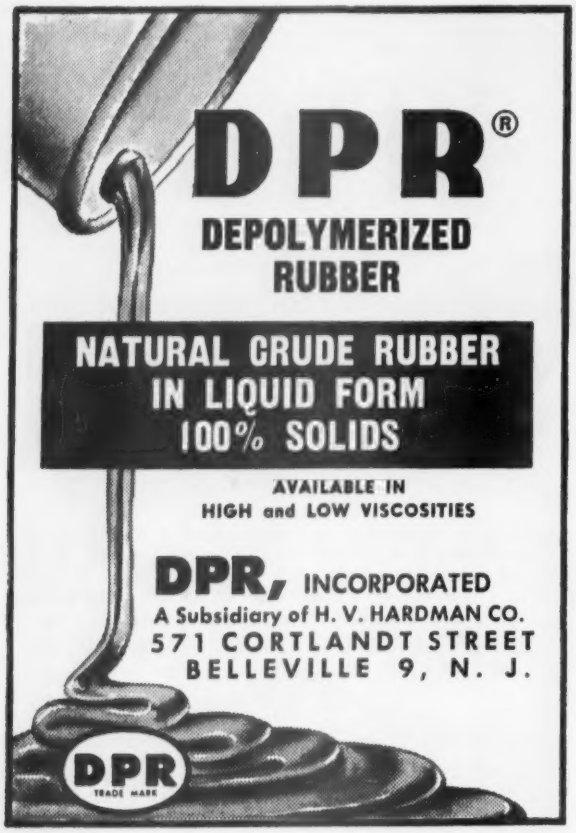
Special comparators are available for measuring all forms of rubber and plastic. Write today for complete information.

Representatives in principal cities

B.C. AMES CO.

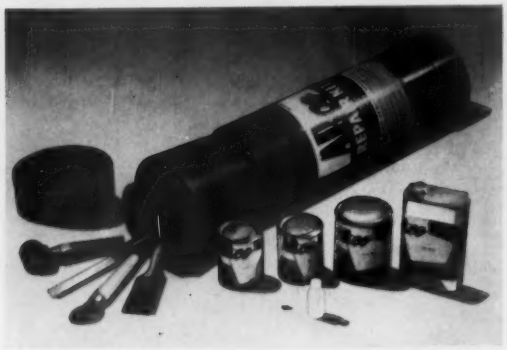
38 Ames Street, Waltham 54, Mass.

MANUFACTURERS OF MICROMETER DIAL GAUGES • MICROMETER DIAL INDICATORS



Arco Rubber Repair Kit

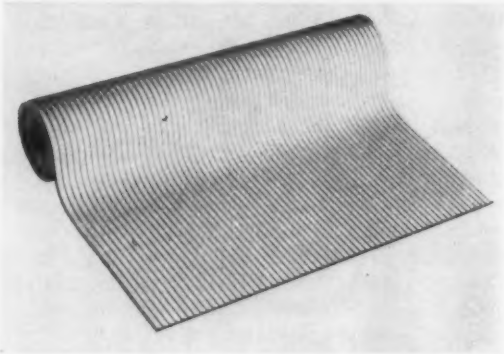
► Automotive Rubber Co., 12550 Beech Road, Detroit 39, Mich., has developed the "Arco Rubber Repair Kit" for the repair of tanks, vessels, fittings and other rubber lined or covered equipment. The portable kit is said to make it possible for on-the-job maintenance and repairs. Simple and complete application instructions and all the



necessary tools and materials are compactly contained in this durable, self-storing kit. Ten and a half square feet of Arco sheet rubber AR-814, manufactured in Arco's rubber mills, also furnished, has been specially compounded to resist all solutions normally contained in rubber lined equipment, Arco states. This sheet rubber is 3/16 inch thick, "spark-tested" to insure freedom of voids, and is guaranteed to be leak-proof.

White Kleen Sweep Matting

► Ace Rubber Products, Inc., Akron, Ohio, has announced the manufacture of what is said to be the perfect matting for hospitals, institutions and marine installations. Designated "White Kleen



Sweep Matting," the mat has a spotless trim appearance, is modern, and easy to sweep, mop or scrub. According to the company, this is the easiest to clean of any type of safety matting. The snowy white rubber and deep rib design give sure, quiet footing and protect floors.

with **ALAMASK®**

subtract rubbery odors... sweeten sales

Sure, you make comfortable mattresses, sturdy hoses, bouncy balls...what else can the customer want? *She wants a totally pleasant product image.* Alamask re-odorizing chemicals help build a pleasant product image by removing sales-discouraging rubbery odors in any natural or synthetic rubber product. Customers are quicker to pick up and buy your rubber products if they look good, work well *and* smell nicer than others.

Which of your rubber products do you want to smell better: **DRY RUBBER:** natural, synthetic, reclaim, chemically blown. **LATEX:** foam, sponge, dipped goods, bonded fibers, adhesives. **ELASTOPLASTICS:** polyvinyl, polyaryl, plastisols. There are specific Alamask treatments for these and other rubbers. Write or phone now for Alamask samples and technical application data for *your* products.

Alamask, for essential industries with non-essential odors.

Rhodia INC.

60 East 56th Street, New York 22, N. Y. (Phone: Plaza 3-4850)

Representatives in:

Philadelphia • Cincinnati • Chicago • Los Angeles • Denver • Montreal • Mexico City

FOR
LOW TEMPERATURE
FLEXIBILITY / in synthetic & natural rubbers
RC PLASTICIZER

TG 8

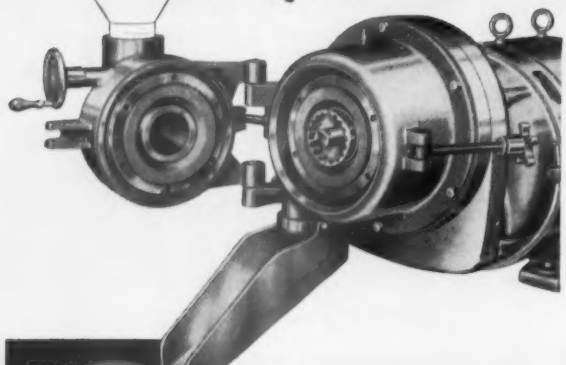
Other RC Plasticizers for the rubber industry include ADIPATES, SEBACATES, DBP, BUTYL OLEATE, TG-9 and BD-8. WRITE FOR SAMPLES!

★ Superior Flex
★ Reduced Nerve
★ Low Volatile Loss
★ Smooth Extrusions

READY . . . RELIABLE . . . RC
SERVING AMERICAN INDUSTRY SINCE 1930

RUBBER CORPORATION OF AMERICA
New South Road, Hicksville 2, N. Y.
Sales Offices: NEW YORK • AKRON • CHICAGO • BOSTON

Blends Best!
Cleans Quickest!



DAY HY-R-SPEED MILLS

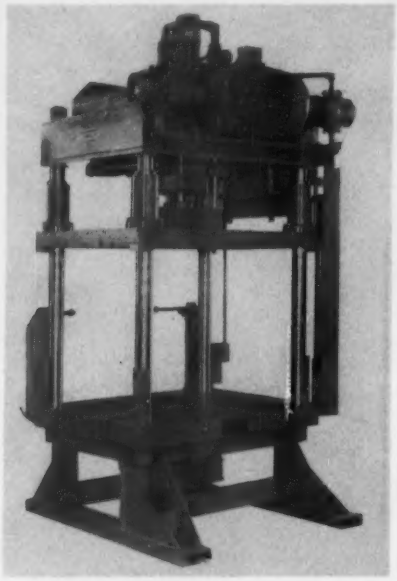
Three sizes: 150-300 gal/min; 100-200 gal/min; 10-20 gal/min. *Write for Bulletin 1057.*

The J. H. DAY *Co.*
Division of The Cleveland Automatic Machine Co.
4918 BEECH STREET, CINCINNATI 12, OHIO

New Equipment

New Air-Hydraulic Trim Press

► A new addition to its line of fast-acting air-hydraulic trim presses for trimming die castings, swaging, stamping, blanking, forming, drawing, shearing and special applications, including trimming rubber and plastic sheets, has been announced by B&T Machinery Co., Holland, Mich.

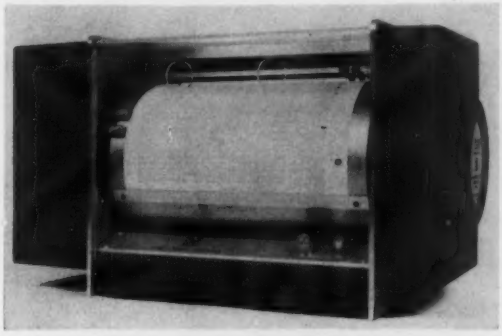


The latest model is a 35-ton press with 48 x 40-inch free working area inside of the 4-inch tie bars. The new trim press has a 30-inch stroke, approach speed of 1400 inches per minute, pressing speed of 140 inches per minute, return speed of 700 inches per minute. The machine is 11 feet high and weighs 19,000 pounds. The press is air-hydraulically actuated and its high speed is obtained by means of air being forced in behind the piston ram under an accumulator system.

Mast Time-Time Plotter

► The Model 750-1 time-time plotter produced by Mast Development Co., Inc., Davenport, Iowa, will record the duration and time of each event in a series of events occurring at regularly or irregularly spaced intervals over a period of time. It is especially suited to such applications as recording valve-open or machine-on times, chemical titrations, batching in chemical operations and all operations where the duration of a repeated event is a significant measure of some continuously varying condition. The standard

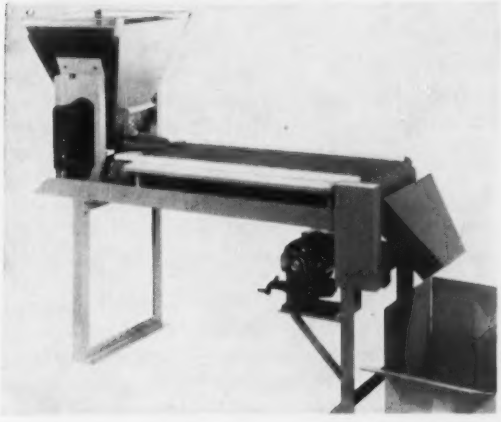
model records events of 0 to 15 seconds duration across the 7-inch long horizontal axis of a graph.



The time of each event occurrence is recorded along a 10-inch vertical axis which is graduated for recording periods up to 48 hours.

Goodman Short Model Inspection Table

► G. F. Goodman & Son, 401 Richmond St., Philadelphia 25, Penna., produces a short model inspection table which occupies a floor area of 6 x 6 feet, and has a height of 4-1/3 feet. Other specifications are: Work belt, 15 inches wide,



spliced endless, waterproof kantry treated duck; Table top, 31 inches from floor, 36 inches in length; Belt speed, variable from 10 to 20 feet per minute; Vibratory feeder, capacity up to 800 pounds of rubber moldings per hour; Power drive, 1/3 hp ball bearing motor, variable speed unit, speed reducer and roller chain; Weight, 300 pounds, shipping weight 380 pounds. Ample room has been provided for two operators. A green plastic coated belt in place of the duck belt is available at a slightly higher price. Belt speeds above or below the standard range, with a 2:1 speed variation, can be furnished to customer's specification at no extra charge. The stainless steel storage hopper has a capacity of two cubic feet.

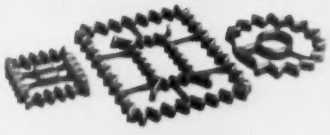
"Copyright, Brown & Bigelow, St. Paul, Minnesota, U.S.A."

g r e e t i n g s

EXPERIENCE... WE HAVE OVER 50 YEARS OF IT...

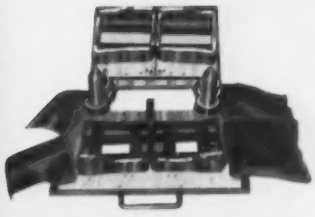
INDEPENDENT AND NEW ERA

Dies For Every Conceivable Purpose



CLICKER, WALKER PUNCH PRESS and MAUL HANDLE

DISTRIBUTORS FOR:
- Foles Clicker Machines and Seelye Beam Die Presses
- Hard Maple, Rubber, and Fibre Composition Die Blocks
- Rubber Pads
- Die Block Hardener
- Raw Hide Mauls



INDEPENDENT DIE & SUPPLY CO.
2602 LA SALLE PLACE... ST. LOUIS 4, MISSOURI
Associate: NEW ERA DIE CO. Red Lion, York County, Pa.

EAGLE-PICHER

Lead & Zinc Compounds

meet the specific demands of the rubber industry . . .

Eagle-Picher manufactures a comprehensive line of both lead and zinc compounds for the rubber industry. Rigid product control is maintained from the ore to the finished product. More than a century of experience assures you of customer service unequalled in the field.

Zinc Oxides	Litharge
Basic White Lead Silicate	Sublimed Litharge
Basic Carbonate of White Lead	Red Lead (95% 97% 98%)
Sublimed White Lead	Sublimed Blue Lead

EAGLE EP PICHER

THE EAGLE-PICHER COMPANY

Since 1843

General Offices: Cincinnati 1, Ohio

West Coast Sales Agent
THE BUNKER HILL COMPANY, Chemical Products Division
Seattle • Portland • Oakland • San Francisco • Los Angeles • Kellogg, Idaho

GUMMI UND ASBEST–PLASTISCHE MASSEN

(Rubber & Asbestos-Plastics)

The international monthly journal of the rubber, asbestos and plastics industries.

Articles in German, English and French
Is regularly read in more than 50 countries
and is the Advertising Medium
for all firms interested in export.

Annual subscription DM 33.60 (incl. postage)

Specimen copy and advertising rates on application to the publishers.

A. W. Gentner-Verlag, Stuttgart / Germany

P. O. Box 668

Hacker Torsional Damping Tester

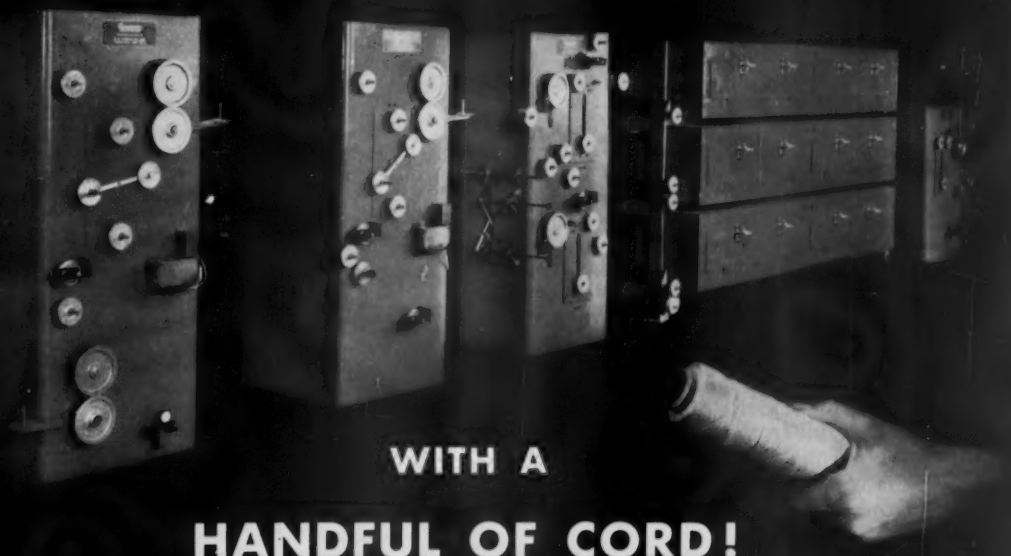
► A torsional damping tester, designated Z-466, has been designed by William J. Hacker & Co., Inc., 82 Beaver St., New York 5, N. Y., for investigating torsional elasticity and damping effects

in rubber, plastics and similar materials by means of free oscillations. Clamping parts can be supplied for foil specimens, tubular specimens and round solid specimens. Temperatures ranging from —50° to +300°C. are said to be obtained in the testing chamber by means of connecting the instrument with refrigerators or thermostats, respectively. Three thermocouples provide a constant check-up of the temperature. A protective gas can be introduced into the testing chamber for specimens which corrode when exposed to air. For the test, the specimen is inserted with its upper end in a fixed clamp which can be turned from outside for initiating the oscillations; on the lower specimen end an inertia disc with a little mirror is attached. The oscillations which fade according to the damping qualities of the specimen are recorded by a photographic apparatus. The frequencies are about 0.1 to 20 per second and are variable according to the selected inertia disc.

► Thermopaper and Thermotube **disposable paper temperature indicators,** manufactured by Paper Thermometer Co., Natick, Mass., are now available for measuring 100, 105 and 110°F., supplementing the previously offered range of 115 through 490°F. They measure temperature by exhibiting irreversible color change when subjected to predetermined temperatures.

ANSWERS

TO EVERY PROCESSING PROBLEM



WITH A

HANDFUL OF CORD!

A single pound of cord . . . experimentally processed on the precise new *Computreater* . . . gives exact empirical answers to any conceivable cord processing problem . . . *fast!*

Whether your investigation concerns cord-and-rubber assemblies in tire cord impregnation, fiber research, air spring development, V-belt construction, conveyor belt design, monofilament manufacture or braided hose production, this remarkable new single-end laboratory unit produces speedy, accurate answers in every phase of process development.

Optimum chemistry, time, thermodynamics and tension can be exactly pinpointed for every stage of the most involved processing plan, using conventional or unfamiliar fibers.

Computreater

BROCHURE ON REQUEST

C. A. LITZLER CO., INC.

SOUND ENGINEERING FOR TOMORROW'S PRODUCTION

1817 BROOKPARK RD. CLEVELAND 9, OHIO CABLE "CALITZ"

EXPORT REPRESENTATIVE: GILLESPIE & CO. OF N. Y., 96 WALL ST., NEW YORK 5, N. Y.

LICENSED FABRICATORS: Benno Schilde Maschinenbau A. G., Bad Hersfeld, Germany; Soc. Alsacienne de Constructions Mecaniques, Paris, France; Mather & Platt, Ltd., Manchester, England

Filling a long-felt gap in technical literature

RUBBER

fundamentals of its science and technology

DR. JEAN LE BRAS
French Rubber Institute

translated by
IRENE E. BERCK, Ph.D.
Editor, Chemical Publishing Co., Inc.

460 pages • illustrated • 1957 • $12.00

This is the first book ever published which thoroughly covers the entire rubber industry, including synthetic elastomers, latices of both natural and synthetic rubbers, and even the pertinent plastics, in less than 500 pages.

It is written especially for the busy rubber chemist and technologist, beginner and student, who have no time to untangle the details they really need from a maze of compiled literature.

Utility is the keynote of the book. With judicious selection from the latest developments in rubber chemistry and physics, theories of elasticity, vulcanization, accelerators, reinforcement, antioxidants, etc., and the most up-to-date procedures of rubber technology and testing, it provides a well-balanced, concise but comprehensive treatise on this vital commodity.

Special attention is given to the principles of selecting the most suitable compounding ingredients to meet the specifications placed on the finished product.

Check These Features

- Up-to-date A to Z coverage
- Balanced theory and practice
- Instructive illustrations
- Comparative evaluation of natural and synthetic rubbers
- Simple and lucid style
- Time-saving index

RUBBER AGE
101 West 31st St., New York 1, N. Y.

Please send me .... copy(ies) of "Rubber—Fundamentals of its Science and Technology" at $12.00 each.

☐ Payment Enclosed ☐ Bill Me

Name .....

Address .....

.....

add 3% for New York City Addresses

Reviews

Physical Chemistry of High Polymers. By Maurice L. Huggins. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 6 x 9¼ in. 176 pp. $6.50.

This volume is the outgrowth of lectures presented by the author when he was a Fulbright Visiting Professor at Osaka and Kyoto Universities in Japan. As indicated by the following chapter titles, he covers his subject thoroughly:

(1) Nomenclature and Classification; (2) Synthesis; (3) Variations in Composition and Structure; (4) The Configuration of Chain Molecules; (5) Thermodynamics of Polymer Solutions: Simplified Theory; (6) Thermodynamics of Polymer Solutions: Revised Theory; (7) Thermodynamics of Polymer Solutions: Phase Equilibria; (8) The Viscosity of Dilute Solutions of Linear Polymers.

Also, (9) Plastic Flow; (10) Long-Range Elasticity; (11) Some Typical Addition Polymers; (12) Some Typical Condensation Polymers; (13) The Structures of Cellulose, Starch, and Their Derivatives; (14) The Structures of Synthetic Polypeptides, Keratin, and Silk; (15) The Structure of Collagen; (16) The Structures of Corpuscular Proteins. Symbol, author and subject indexes are included at the end of the volume. Pertinent literature references appear at the end of each chapter.

This book could well serve as an advanced textbook for students of physical chemistry of the high polymers. The molecular structures of synthetic and natural high polymers (including proteins) are described in detail. Emphasis is on fundamental principles and on the explanation of properties in terms of molecular structure. Recent important work in the field is described, including the author's previously unpublished theory of the dependence of the thermodynamic properties of polymer solutions on the sizes, shapes and structures of the component molecules. Much basic information pertinent to the work of the rubber chemist is included here. The presentation is attractive and legible, and the writing clear and concise.

•

Problems and Practices in Engineering Management. (Special Report No. 24). Published by American Management Association, Inc., 1515 Broadway, New York 36, N. Y. 6 x 9 in. 132 pp. $2.50 (members); $3.75 (non-members).

There is no immediate end in sight to the critical shortage of engineers. Forward-planning companies are taking a new, hard look at the situation, re-examining their existing engineering organizations and applying new management techniques to get more out of their present organization structures. This report is designed to bring management up to date on how best to use its engineers, both in technical capacities and as managers. The papers of which it is comprised were originally presented at a special conference held by the American Management Association's Research and Development Division.

The book is divided into four parts on (1) The Challenge to Management, (2) The Engineering Organization: Its Structure and Functions, (3) Administering the Engineering Program, and (4) Systems Engineering. Three papers are presented on each of these topics. The authors were recruited from the academic world and from some of the largest industrial organizations which utilize engineering personnel. Many of their ideas and observations are thought provoking, and well worth evaluation by administrators who deal with the current engineering personnel market.

Merry Christmas
with all good Wishes for a HAPPY NEW YEAR from everyone at...
The C.P. Hall Co.
Call Hall
and keep your chemists and compounders in Christmas mood all year long... with the best in chemicals

AKRON	CHICAGO	MEMPHIS	LOS ANGELES	NEWARK
PHONE	PHONE	PHONE	PHONE	PHONE
JEfferson	POrtsmouth	JAckson	MAdison	MArket
5-5175	7-4600	6-8253	2-2022	2-2652

The C.P. Hall Co.
CHEMICAL MANUFACTURERS

Institution of the Rubber Industry

LONDON

You are invited to become a member. The annual subscription of $7.50 brings to members the bi-monthly TRANSACTIONS and PROCEEDINGS, which contain many original papers and important articles of value to rubber scientists, technologists, and engineers.

Members have the privilege of purchasing at reduced rates other publications of the Institution, including the ANNUAL REPORT ON THE PROGRESS OF RUBBER TECHNOLOGY (which presents a convenient review of advances in rubber), and a series of MONOGRAPHS on special aspects of rubber technology (monographs published to date deal with Tire Design, Aging and Calendering).

Further details are easily obtained by writing to:

Secretary,

INSTITUTION OF THE RUBBER INDUSTRY
4, KENSINGTON PALACE GARDENS
LONDON, W.8., ENGLAND
Telephone: Bayswater 9101

The Effects of Ionizing Radiation on Natural and Synthetic High Polymers. By Frank A. Bovey. Published by Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 6¼ x 9¼ in. 288 pp. $8.00.

During the last years there have been such spectacular developments in certain branches of polymer science that the publishers of this book felt the advisability of launching a series dealing with the most important of the new innovations and trends. This book, on ionizing radiation, is the first of the volumes, its subject being chosen because of the extraordinary theoretical and practical interest currently evidenced in the rubber industry. This work, as will all in the series, has its emphasis placed on the principles which caused the new branch of science to grow, on a comprehensive presentation of the actual state of current knowledge, and a broad outline of those ideas and methods which can be foreseen to control future development.

A listing of the contents gives an idea of the scope of the material: (1) Properties of Ionizing Radiations; (2) Chemical Effects of Ionizing Radiations; (3) Radiation Chemistry of Polymers (General); (4) Statistical Treatment of Cross-linking and Scission Occurring under Ionizing Radiation; (5) Hydrocarbon Polymers; (6) Acrylate and Methacrylate Polymers and Miscellaneous Oxygen-Containing Addition Polymers; (7) Chloro and Fluoro Polymers; (8) Diolefin Polymers; (9) Condensation Polymers; (10) Natural Polymers and Derivatives.

Also included is an appendix which presents data on the effects of high energy radiation on polymers in tabular form. The various polymers are listed with an indication of chemical structure, predominant reaction produced by the radiation, total energy dissipated in a polymer during the formation of a cross-linked unit, and total energy dissipated in a polymer during the formation of a main chain scission. A glossary of principal symbols and author and subject indexes close the volume.

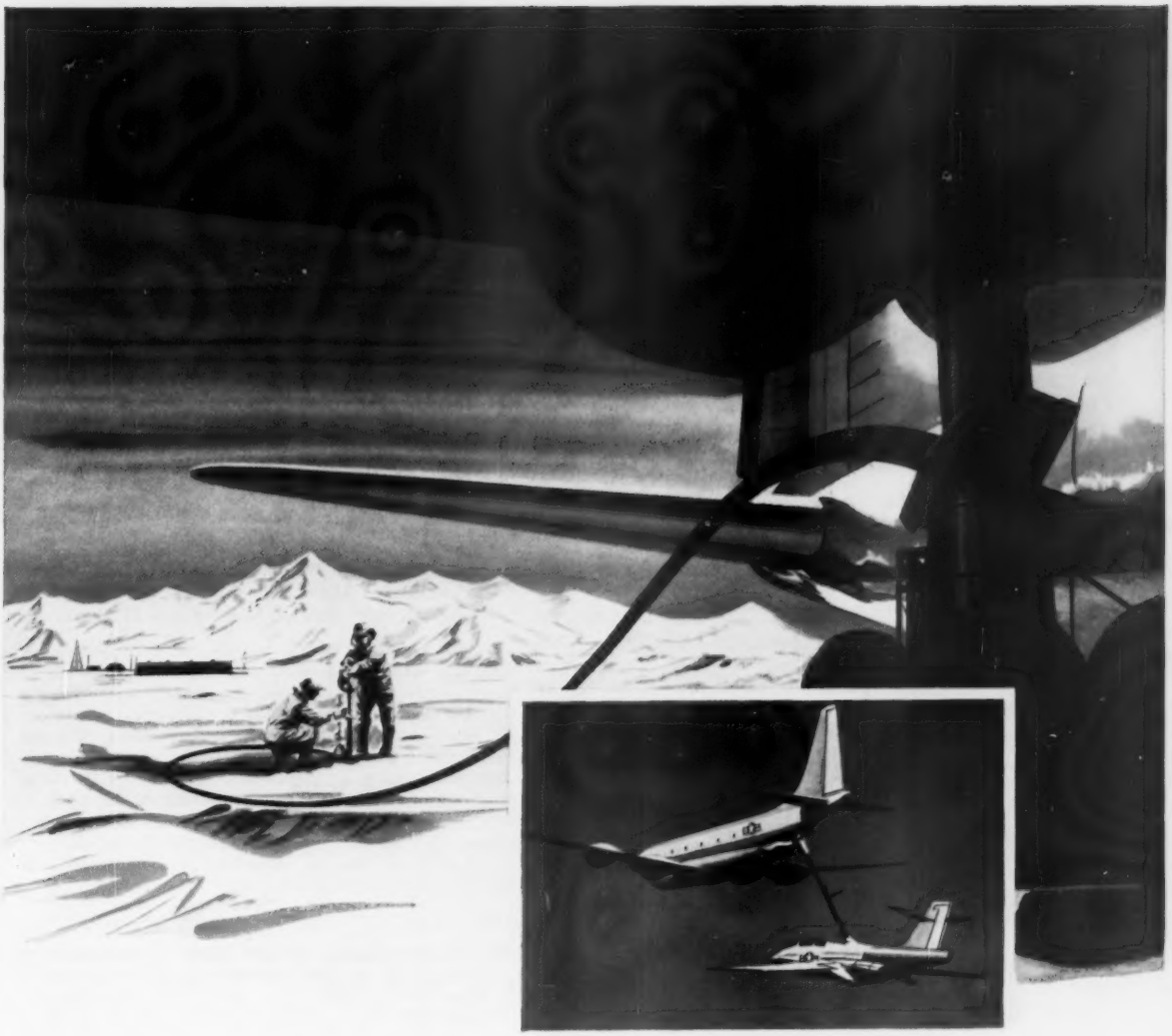
The book is a critical review, not an exhaustive monograph. It analyzes the most significant basic research, most of which is of a very recent date. This in many instances touches on studies of a practical or technological nature, as they represent the only knowledge available concerning certain of the polymers. Much valuable information is included in the volume, which will prove of value to many in the expanding fields of radiation and rubber technology.

•

Directory of New England Manufacturers: 1959. Published by George D. Hall Co., 20 Kilby St., Boston 9, Mass. 7¾ x 11 in. 788 pp. $45.00.

The twenty-third annual edition of this directory, which is issued by the publisher with the editorial cooperation of The New England Council, provides a complete guide to manufacturing in the New England states. The main parts include an alphabetical section of almost 500 pages in which manufacturing companies and relevant information (addresses, personnel, capital ratings, etc.) are listed. Also presented are a products section index (with 17 items listed under rubber) and a geographical section. Another part details the companies which make specific products (rubber belting, clothing, flooring, footwear, etc.). The last part of the book is a listing of brand names.

This volume makes a comprehensive survey of manufacturing activities, available products and services in the New England area. It is a valuable handbook for attaining information quickly about companies; about whom to contact in a specific geographical location for a certain product, and for providing a section-wide survey of manufacturing activities by industry. A useful guide to the New England section.



Flexibility at extreme low temperatures

with THIOKOL® PLASTICIZER TP-90B

Gassing up aircraft in the deep freeze of the frigid zone . . .

. . . refueling on the wing in the sub-zero temperature of high altitudes . . .

. . . it takes unique rubber hose to keep flexible in such extremes of cold.

Leading hose manufacturers achieve the low temperature resistance needed by combining THIOKOL plasticizer TP-90B with selected types of elastomers.

THIOKOL plasticizer TP-90B is highly compatible with all elastomers and imparts flexibility which remains unaffected at extremely low temperatures. For further details, send the coupon.

Thiokol®
CHEMICAL CORPORATION

®Registered Trademark of Thiokol Chemical Corp. for its liquid polymers, synthetic rubbers, rocket propellants, plasticizers and other chemical products.

FOR MORE INFORMATION:
Mail coupon to Dept. 11, Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton, N. J. In Canada: Naugatuck Chemicals Division, Dominion Rubber Co., Elmira, Ontario.

Gentlemen: Please send me further details about plasticizer TP-90B.

Firm_____

Street_____

City_____ State_____

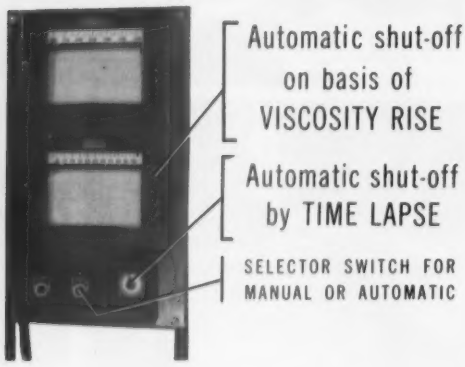
Your Name_____

SAVE 75%
OF OPERATOR'S TIME

ON YOUR

SCOTT STI or NBS
MOONEY VISCOMETER

with these
Automatic Controls



These automatic controls, when applied to your Mooney recorder, save 75% of operator's time. The operating sequence is:

1. **Load machine.**
2. **Push START button.**
3. **The automatic controls take over as follows:**
   a) **1-minute warm-up.**
   b) **Recording commences and continues until Viscometer is shut off on basis of VISCOSITY RISE and/or TIME.**
   c) **Viscometer shut-off stops recorder.**

Applicable to YOUR Scott Mooney

If your recorder does not have these controls, contact us for advice. (This automatic operation is in complete conformance with ASTM Methods D 927 and D 1077.)

Request now "CRE Bulletin"

SCOTT TESTERS, INC.
85 Blackstone St., Providence, R. I.
Representatives in Foreign Countries

New Symbol of World-Standard Testing

BOOKLETS, CATALOGS, etc.

Link-Belt Precision Steel Roller Chains and Sprockets. (Book No. 2657). Link-Belt Co., Prudential Plaza, Chicago 1, Ill. 8½ x 11 in. 154 pp.

Described by its publisher as the most comprehensive book ever written on precision steel roller chains and sprockets, this booklet presents detailed engineering data on their use in a wide range of applications. The selection, application, installation, lubrication and maintenance of roller chains and sprockets for drives and conveyors are described. A corrosion resistance table is included. Precision steel roller chains and sprockets for power transmission service are presented in a 66-page section, with illustrations showing chains from ¼-inch to 3-inch pitch in actual size. Chains and attachments for conveying applications are listed in another 26-page section. Additional information is also included.

•

Adipic Acid. (Technical Bulletin I-12R). National Aniline Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. 8½ x 11 in. 36 pp.

The new edition of this bulletin has been completely revised and expanded to include current information on adipic acid. Basic data on this widely used reactive dicarboxylic acid include a listing of physical properties, six pages of chemical properties and reactions, 19 pages of suggested uses and a list of 271 literature references. Also presented is a "family tree" diagram of the basic reactions of adipic acid. Suggested uses include applications in elastomers (as a common reactant in the preparation of urethane, polyester and polyamide rubbers), as plasticizers, and in adhesives (for improving the adhesion of rubber to tire fabrics).

•

The Effects of Accelerator and Sulfur Concentrations on Ozone Resistance and Physical Properties in the Sulfur Type Cure. (Bulletin No. 100-5). Thiokol Chemical Corp., 780 North Clinton Ave., Trenton, N. J. 8½ x 11 in. 14 pp.

The purpose of the study reported in this bulletin was to evaluate primary and secondary accelerators and the effect of varying sulfur concentrations on the vulcanization of butyl rubber. Two primary and seven secondary accelerators produced by five manufacturers were studied. Test procedures are described, and conclusions drawn on the effect of sulfur/primary accelerator variations; of varying primary/secondary accelerator level; effects of other secondary accelerators, and effects on ozone resistance. Graphs, charts and tables are used to portray the extensive data.

•

Choosing the Right Polyglycol. Dow Chemical Co., Midland, Mich. 8½ x 11 in. 24 pp.

Polyglycols are high molecular weight compounds produced by reacting alkylene oxides with compounds having active hydrogen. Among those described in this booklet are polyethylene glycols, polypropylene glycols, polybutylene glycols, polyepichlorohydrins, polystyrene glycols and miscellaneous ones, including five new trihydroxy polypropylene glycols. Uses for these materials include application in urethane foams to achieve better physical properties; as lubricants and mold release agents, and as an additive to rubber to achieve shorter cures when silicone dioxide is present as a binder and extender. The closing sections are devoted to manufacturing processes, effect of oxides on properties and toxicity and handling precautions.

60 GRADES AND GRINDS MEET EVERY SULFUR NEED

PROCESSED CRUDE SULFURS
All grades 99.5% pure in sizes from 325-mesh to mixed fines and lumps.

REFINED INDUSTRIAL SULFURS
Grades range in fineness from 200-mesh through cones, sticks, lumps, solid barrels, all 99.85% minimum pure.

DISPERSED SULFUR
An aqueous dispersion, 68% sulfur, of particles averaging less than 2 microns in diameter.

RUBBERMAKERS' SULFURS
Specially formulated and standardized for tires, tubes and rubber specialties. Pure sulfur content from 68% (dispersed) to 99.8%. Sizes from 80- to 325-mesh.

CRYSTEX® INSOLUBLE SULFUR
Stauffer's insoluble sulfur, "Crystex", is a thermoplastic high polymer with a molecular weight in the order of hundreds of thousands. At least 85% of this material is insoluble in uncured rubber . . . does not migrate . . . eliminates "bloom".

AGRICULTURAL SULFURS
Among many grades are Dusting, Wettable, Dip and Coarse sulfurs for a wide variety of agricultural and livestock uses.

Stauffer is the country's largest user of sulfur and largest marketer of processed sulfurs.

Send for "The Newest Book on the Oldest Chemical". This 52-page book is not only a catalog of Stauffer Sulfurs but an authoritative treatise on Sulfur with many illustrations and useful tables.

STAUFFER CHEMICAL COMPANY

380 Madison Avenue, New York 17, N. Y.
Prudential Plaza, Chicago 1, Illinois
636 California Street, San Francisco 8, California
P. O. Box 9716, Houston 15, Texas

Stauffer CHEMICALS SINCE 1885

MARKET REPORTS

TRENDS
NEWS
PRICES

Natural Rubber

Since our last report (November 3), the price of natural rubber on the New York Commodity Exchange has moved in a range of 150 points, high for the period being 32.63c reached on November 10 and 11, and low being 31.13c reached on November 7. The average price of spot rubber for the month of November was 32.10c based on 17 trading days. This compares with an average of 31.06c in the previous month.

Analysts at Merrill Lynch, Pierce, Fenner & Smith note that the futures market continues to forge ahead to new highs. The recent strength in rubber largely has stemmed from Russian purchases in Singapore. This is one reason why Singapore prices have led London.

Russian Imports Increasing

Russian imports have been proceeding at four times the rate of a year ago; and with world supplies of natural rubber so closely in balance, the market is particularly vulnerable.

The possibility exists that rubber purchases by the Communist bloc may be curtailed in the next few months. Even with this possibility, however, there are still enough pressures on natural rubber to maintain current price levels.

As we know, world natural rubber production seems to have levelled off in this decade at between 1.8 and 1.9 million tons per year. Despite a drop in natural rubber consumption in the United States, natural consumption abroad has been increasing. In short, the world now faces a deficit in natural rubber. The 1958 deficit may amount to more than 200,000 long tons. That is, were it available, 200,000 long tons more would have been consumed.

MLPFS analysts feel that 1.9 million long tons of natural rubber will be produced in 1959 and that there will be a world deficit of 315,000 long tons. United States' consumption in 1959 is predicated on an economy in which 1½ million more passenger cars will be produced than were produced in 1958.

It is estimated that the United States will consume something like 545,000 long tons of natural rubber in 1959. It is suggested that this figure might be higher except for the price differential which exists between natural and synthetic rubber.

1959 World Consumption

It is estimated that were it available the rest of the world would use 1,670,000 long tons of natural in 1959. The projected United States' use and world use total 2,215,000 long tons. Here then we account for the potential deficit of over 300,000 long tons.

At any rate, the immediate future seems to hold little hope for a price drop in natural rubber.

NEW YORK, DECEMBER 1, 1958

Price Data

Closing Rubber Prices on New York Commody Exchange

FROM NOV. 1 TO NOV. 30

Nov.	Spot	Jan.	Mar.	May	Sales
1	....	....	....	....	...
2	....	....	....	....	...
3	31.50	31.27	31.20	31.18	25
4	....	....	....	....	...
5	31.88	31.56	31.45	31.35	104
6	31.88	31.60	31.40	31.36	39
7	31.13	31.65	31.50	31.35	38
8	....	....	....	....	...
9	....	....	....	....	...
10	32.63	32.30	32.15	32.10	81
11	....	....	....	....	...
12	32.63	32.25	32.05	31.95	35
13	32.38	31.95	31.85	31.82	29
14	32.38	32.00	31.84	31.74	150
15	....	....	....	....	...
16	....	....	....	....	...
17	32.25	31.90	31.70	31.55	17
18	32.00	31.75	31.50	31.38	44
19	32.00	31.50	31.20	31.10	79
20	32.00	31.70	31.40	31.25	36
21	32.38	32.10	31.70	31.55	34
22	....	....	....	....	...
23	....	....	....	....	...
24	32.13	31.95	31.40	31.25	52
25	32.00	31.30	30.75	30.50	112
26	32.25	31.70	31.20	31.00	101
27	....	....	....	....	...
28	31.25	31.15	30.87	30.60	31
29	....	....	....	....	...
30	....	....	....	....	...

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.31⅛
Jan.	.30¾
Feb.	.30⅝
Thin Latex Crepe:	
Spot	.33¾
Thin Brown Crepe, No. 2	.26⅜
Flat Bark Crepe	.22⅜

London Market
(Standard Smoked Sheets)

Jan.-Mar.	29.36 — 29.50
Apr.-June	29.50 — 29.79

Singapore Market
(Standard Smoked Sheets)

Jan.	28.23 — 28.27

Middling Upland Quotations

	Oct. 31	December 1		
	Close	High	Low	Close
Dec.	36.27	34.95	34.83	34.89
Mar.	36.70	35.63	35.44	35.53
May	36.51	35.53	35.33	35.44

Notes & Quotes

Russell DeYoung, president of the Goodyear Tire & Rubber Co., is of the opinion that the rubber industry could reach its highest dollar volume in history in 1959. The automobile industry, by its own estimates, will require tires and other rubber industry products for at least a million more cars in 1959 than were produced in 1958. Similar percentage production increases are expected for trucks, tractors and other motor vehicles.

Synthetic Rubber

At the recent meeting of the Rubber Manufacturers Association (reported on elsewhere in this issue), Karl O. Nygaard of the B. F. Goodrich Co. had some interesting things to say about the synthetic rubber situation. Mr. Nygaard pointed out that synthetic rubber will account for virtually all of the increase in world new rubber supplies over the next several years.

This in no way detracts from the real progress that has been made by certain segments of the natural rubber industry. However, the facts as they now stand point to no appreciable increase in natural rubber production in the years that lie ahead.

Free World Capacity

Mr. Nygaard noted that synthetic rubber capacity in the Free World outside of the United States is growing rapidly. The transfer of the synthetic plants in the United States from Government to private ownership in 1955 sparked expansions which increased production capacity to 1.6 million tons by the end of 1957—a gain of nearly 50 per cent within two years.

Now, new plants in other free nations are accounting for new productive capacity. This year, estimates Mr. Nygaard, 225,000 long tons of synthetic rubber will be produced in free nations outside of the United States. By 1962, productive capacity in these nations will have almost tripled.

Synthetic rubber is accounting for an increasing share of total new rubber requirements in both the United States and in other free nations of the world. Of the total new rubber consumption in the United States in 1958 approximately 64.2 per cent will be synthetic. It will be remembered that in the previous year 63.2 per cent was synthetic.

In other free nations of the world, the rising trend in synthetic rubber consumption has continued almost without interruption since the end of World War II. These nations will consume an estimated 375,000 long tons of synthetic rubber in 1958, equivalent to about 25 per cent of their total new rubber requirements.

Synthetic Ratio Climbing

In 1957, the percentage of synthetic rubber was 23.8 per cent and in 1956 it was 20 per cent.

This trend toward increased usage of synthetic rubber not only will be extended, said Mr. Nygaard, but will be hastened by the step-up in synthetic rubber capacity in these countries and the lack of growth in natural rubber production.

It now seems evident that synthetic rubber will continue on the upswing for the foreseeable future. Some are of the opinion that a 70-30 ratio may prevail within the next year or so in the United States.

"peace on earth, toward men goodwill"

American Cyanamid Company • Rubber Chemicals Department • Bound Brook, New Jersey

PRICES OF COMMERCIALLY AVAILABLE SYNTHETIC RUBBER

Dry Rubber

(per pound carload)

Butadiene-Acrylonitrile Types

Butaprene NF	.4900
Butaprene NH	.6500
Butaprene NL	.5000
Butaprene NXM	.5800
Chemigum N1	.6400
Chemigum N3	.5800
Chemigum N5	.5800
Chemigum N6	.5000
Chemigum N6B	.5000
Chemigum N7	.5000
Chemigum N8	.5000
Herecol N-33	.6800
Hycar 1001	.5800
Hycar 1002	.5000
Hycar 1014	.6000
Hycar 1041	.5800
Hycar 1042 and 1043	.5000
Hycar 1312	.5000
Hycar 1411	.6200
Hycar 1432	.5900
Hycar 1441	.6200
Paracril AJ	.4850
Paracril ALT	.5000
Paracril B and BJ	.5000
Paracril BLT and BJLT	.5000
Paracril C and CLT	.5800
Paracril CV	.5900
Paracril D	.6500
Paracril 18-80	.6000
Paracril OZO	.4600
Polysar Krynac 800	.5000
Polysar Krynac 801	.5800
Polysar Krynac 802	.5000
Polysar Krynac 803	.5000

Butadiene-Styrene Types

Ameripol 1000	.2410
Ameripol 1001	.2410
Ameripol 1002	.2435
Ameripol 1006	.2410
Ameripol 1006 (crumb)	.2475
Ameripol 1007	.2410
Ameripol 1009	.2590
Ameripol 1011	.2475
Ameripol 1012	.2425
Ameripol 1012 (crumb)	.2490
Ameripol 1013	.2500
Ameripol 1013 (crumb)	.2615
Ameripol 1500	.2410
Ameripol 1501	.2410
Ameripol 1502	.2410
Ameripol 1703	.2060
Ameripol 1705	.2035
Ameripol 1707	.1910
Ameripol 1708	.1910
Ameripol 1710	.1885
Ameripol 1712	.1885
Ameripol 4650	.1820
Ameripol 4651	.1770
Ameripol 4652	.1425
Ameripol 4700	.1750
Ameripol 4701	.1725
Ameripol 4750	.1545
ASRC 1000	.2410
ASRC 1001	.2401
ASRC 1004	.2401
ASRC 1006	.2410
ASRC 1009	.2475
ASRC 1018	.2700
ASRC 1019	.2650
ASRC 1500	.2410
ASRC 1502	.2410
ASRC 1503	.2625
ASRC 1703	.2060
ASRC 1708	.1910
ASCR 3110	.2600
Baytown 1600	.1760
Baytown 1601	.1760
Baytown 1602	.1760
Baytown 1801	.1600
Carbomix 3750	.1820
Carbomix 3751	.1545
Carbomix 3752	.1870
Carbomix 3753	.1640
Carbomix 3754	.1790
Carbomix 3755	.1535
Copo 1500	.2410
Copo 1502	.2410
Copo 1505	.2610
Copo 1712	.1885
Copo 1773	.2060
Copo 1778	.1910
Copo 3900	.2310
FR-S 1000	.2410
FR-S 1001	.2410
FR-S 1004	.2410
FR-S 1006	.2410
FR-S 1009	.2475
FR-S 1010	.2600
FR-S 1012	.2425
FR-S 1013	.2500
FR-S 1014	.2810
FR-S 1015	.2910
FR-S 1500	.2410
FR-S 1502	.2410
FR-S 1703	.2060
FR-S 1705	.2035
FR-S 1712	.1885
Naugapol 1016	.2650
Naugapol 1018	.2700
Naugapol 1019	.2650
Naugapol 1021	.3000
Naugapol 1022	.2800
Naugapol 1023	.2850
Naugapol 1503	.2625
Naugapol 1504	.2950
Philprene 1000	.2410
Philprene 1001	.2410
Philprene 1006	.2410
Philprene 1009	.2475
Philprene 1010	.2600
Philprene 1018	.2700
Philprene 1019	.2650
Philprene 1100	.1940
Philprene 1104	.1900
Philprene 1500	.2410
Philprene 1502	.2410
Philprene 1503	.2625
Philprene 1600	.1930
Philprene 1601	.1930
Philprene 1605	.1900
Philprene 1703	.2060
Philprene 1706	.2030
Philprene 1708	.1910
Philprene 1712	.1885
Philprene 1803	.1740
Plioflex 1006	.2410
Plioflex 1500	.2410
Plioflex 1502	.2410
Plioflex 1703	.2060
Plioflex 1710	.1885
Plioflex 1712	.1885
Plioflex 1773	.2060
Plioflex 1778	.1910
Polysar Kryflex 200	.2510
Polysar Krylene	.2410
Polysar Krylene NS	.2410
Polysar Krynol 651	.1885
Polysar Krynol 652	.1910
Polysar S	.2410
Polysar S-50	.2410
Polysar S-X 371	.2550
Polysar SS-250	.2875
S-1000	.2300
S-1002	.2325
S-1006	.2300
S-1009	.2400
S-1011	.2325
S-1013	.2300
S-1100	.1850
S-1500	.2300
S-1502	.2300
S-1506	.2500
S-1600	.1825
S-1602	.1825
S-1703	.1950
S-1706	.1925
S-1707	.1800
S-1709	.1775
S-1712	.1775
S-1803	.1650
S-1804	.1750
Synpol 1000	.2410
Synpol 1001	.2410
Synpol 1002	.2435
Synpol 1006	.2410
Synpol 1007	.2410
Synpol 1009	.2475
Synpol 1012	.2425
Synpol 1013	.2500
Synpol 1061	.2410
Synpol 1500	.2410
Synpol 1502	.2410
Synpol 1551	.2410
Synpol 1703	.2060
Synpol 1707	.1910
Synpol 1708	.1910
Synpol 1711	.1900
Synpol 1712	.1885

Butyl Rubbers

Enjay Butyl 035 and 150	.2300
Enjay Butyl 165 NS	.2400
Enjay Butyl 215	.2300
Enjay Butyl 217	.2300
Enjay Butyl 218	.2300
Enjay Butyl 268 NS	.2400
Enjay Buty 325	.2300
Enjay Butyl 365 NS	.2400
Polysar Butyl 100	.2450
Polysar Butyl 101	.2775
Polysar Butyl 200 and 300	.2450
Polycar Butyl 301	.2550
Polysar Butyl 400	.2450

Chlorosulfonated Polyethylene

Hypalon 20	.7000
Hypalon 30	.7000

Neoprene

	(prices l.c.l.)
Neoprene Types AC and CG	.5500
Neoprene Type AD	.5500
Neoprene Type FB	.6500
Neoprene Type GN	.4100
Neoprene Type GN-A	.4100
Neoprene Type GRT	.4200
Neoprene Type KNR	.7500
Neoprene Type S	.4200
Neoprene Type W	.3900
Neoprene Type WB	.4100
Neoprene Type WHV	.3900
Neoprene Type WRT	.4500
Neoprene Type WX	.4100

Polysulfide Rubbers

	(prices l.c.l.)
Thiokol Type A	.5000
Thiokol Type FA	.6900
Thiokol Type ST	1.2500

Silicone Rubbers*

	(prices l.c.l.)
GE (compounded)	2.50
GE Silicone Gum (not compounded)	4.00
Silastic (compounded)	1.90
Silastic (gums)	3.85
Union Carbide (gums)	4.00
Union Carbide (compounds)	2.50

Latex

(per pound carload)

Butadiene-Acrylonitrile Types

Butaprene N-300	.4600
Butaprene N-400	.5400
Butaprene N-401	.5400
Chemigum 200	.4900
Chemigum 235	.5400
Chemigum 236	.5400
Chemigum 245	.4600
Chemigum 246	.4600
Chemigum 247	.4600
Chemigum 248	.4600
Hycar 1512	.4600
Hycar 1551	.5400
Hycar 1552	.4600
Hycar 1561	.5400
Hycar 1562	.4600
Hycar 1571	.5400
Hycar 1572	.5100
Hycar 1577	.4600
Hycar 1852	.4600
Nitrex 2612	.4600
Nitrex 2614	.4600
Nitrex 2614-A	.4600
Nitrex 2615	.5100
Nitrex 2615-A	.5100
Nitrex 2616	.5400
Nitrex 2617	.4600
Nitrex 2617-A	.4600
Nitrex 2619	.5300
Nitrex 2620	.4600
Nitrex 2625	.4600

Butadiene-Styrene Types

Copo 2101	.3000
Copo 2102	.3200
Copo 2105	.3200
Copo 2108	.3375
Copo 2110	.3200

POLYMERS

Copo X-800	.2775 [3]
FR-S 2000	.2775 [3]
FR-S 2001	.2775 [3]
FR-S 2002	.3000 [3]
FR-S 2003	.3050 [3]
FR-S 2004	.3050 [3]
FR-S 2006	.2900 [3]
FR-S 2105	.3200 [3]
Naugatex 2000	.2775 [1]
Naugatex 2001	.2775 [1]
Naugatex 2002	.3000 [1]
Naugatex 2006	.2900 [1]
Naugatex 2105	.3200 [1]
Naugatex 2107	.3200 [1]
Naugatex 2108	.3000 [1]
Pliolite 2000	.2775 [3]
Pliolite 2001	.2775 [3]
Pliolite 2076	.2900 [3]
Pliolite 2104	.3200 [3]
Pliolite 2105	.3200 [3]
Pliolite 2107	.3200 [3]
Pliolite 2108	.3000 [3]
S-2000	.2275 [3]
S-2006	.2150 [3]
S-2101	.2250 [3]
S-2105	.3100 [3]
S-2107	.3200 [3]

Neoprene

Neoprene Latex 60	.4000 [3]
Neoprene Latex 571	.3700 [3]
Neoprene Latex 572	.3900 [3]
Neoprene Latex 601-A	.4000 [3]
Neoprene Latex 673	.5000 [3]
Neoprene Latex 735	.3800 [3]
Neoprene Latex 736	.3800 [3]
Neoprene Latex 842-A	.3700 [3]
Neoprene Latex 950	.4700 [3]

Polysulfide Rubbers

Thiokol Type MX	.8000 [3]
Thiokol Type WD-2	1.2500 [3]
Thiokol Type WD-6	.8000 [3]

Notes: (1) Freight allowed. (2) Freight extra. (3) Freight prepaid. *Covers a wide range of compounds. Readers are urged to check specific prices with producers.

SUPPLIERS

Are Your

Synthetic Rubbers

Listed

in This Section?

if not

Forward full information

to

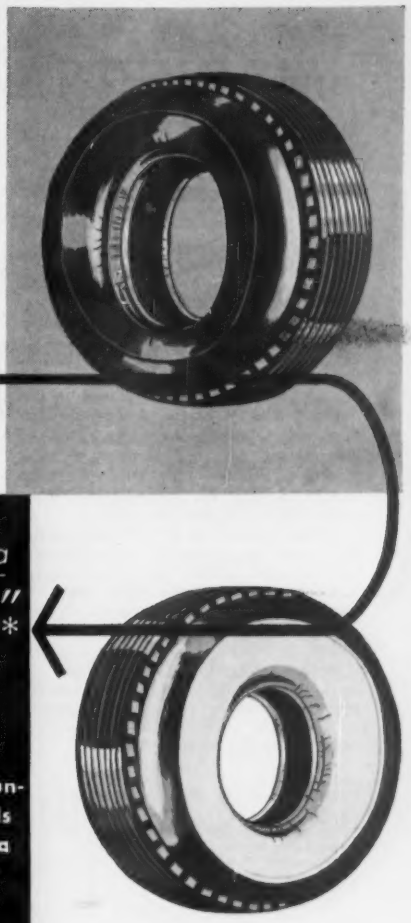
Market Editor

RUBBER AGE

101 West 31st St.,

New York 1, N. Y.

for MAXIMUM SUN-CHECKING PROTECTION



Specify Original Formula

"Antisun"* by CARY

Maximum protection against sun-checking over extended periods can only be guaranteed when a top-notch sun-checking agent is employed.

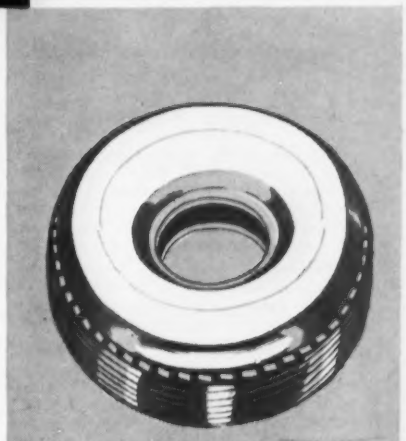
*Registered Trade Mark

Cary "Antisun"

formulated of the finest quality ingredients and proven so satisfactory in tire compounding, mechanical goods, insulated wire and cable compounds, is still the same basic formula developed by our President years ago.

- Recommended usage: 2-4% of the weight of the rubber hydrocarbon, depending on the degree of protection desired.
- Unlimited Availability.
- Low Cost.
- Available in convenient chipped or slabbed forms.

Accept no substitute for this time-tested, highest quality product—CARY "ANTISUN."



Cary Chemicals Inc.

P. O. BOX 1128, NEW BRUNSWICK, NEW JERSEY

Laboratory and Plant: RYDERS LANE, EAST BRUNSWICK, NEW JERSEY

CHarter 9-8181

CARY CHEMICALS PRODUCTS:

- Vinyl Resins
- Vinyl Compounds
- Vinyl Plasticizers
- Sun Checking Waxes
- Gilsonite Compounds
- High Melting Point Synthetic Waxes

Canadian Representative: Lewis Specialties, Ltd., 18 Westminster North, Montreal 28, Que.

MARKETS

(continued)

Reclaimed Rubber

The Rubber Manufacturers Association reports that in the first ten months of 1958 a total of 212,659 long tons of reclaimed rubber were produced in the United States. This compares with the 231,417 long tons produced in the first ten months of the preceding year.

As for consumption, RMA reports that in the first ten months of 1958 a total of 202,086 long tons were used compared with the 228,078 long tons consumed in the previous year.

It now appears as if 1958 will see the production of a total of about 255,000 long tons of reclaim and the consumption of some 240,000 long tons. In 1957, 271,647 long tons were in new supply and 267,352 long tons were consumed.

By this reckoning, 1958 will turn out to have been a fairly good year for the reclaimed rubber industry. Certainly, the year-end totals will be higher than expected earlier in the year.

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.11½
First Line Whole Tire	.11
Second Line Whole Tire	.10½
Third Line Whole Tire	.10¼
Fourth Line Whole Tire	.09¾
Black Carcass	.15¼
No. 1 Light Colored Carcass	.22
No. 1 Peel	.11
Butyl Tub Reclaim	.14
Natural Rubber Black Tube	.16
Natural Rubber Red Tube	.21
Natural Rubber Gray Tube	.21

Scrap Rubber

Activity in the scrap rubber market held at fairly good levels during the Thanksgiving Holiday week with reclaimers continuing to buy on a regular basis. Some purchases of scrap have been noted for inventory purposes.

Reclaimers have been buying butyl tubes and what with increased activity in the automobile industry there has been a parallel rise in business for reclaimers and for the scrap market.

The Rubber Manufacturers Association reports that in the first ten months of this year 184,989 long tons of scrap rubber were consumed. This indicates that about 220,000 long tons will be consumed for the year.

(Prices Delivered Akron)

Mixed tires	ton	14.00
Light colored carcass	lb.	.04¼
No. 1 peelings	ton	28.00
No. 2 peelings	ton	25.00
No. 3 peelings	ton	18.00
Buffings	ton	16.00
Truck and Bus S.A.G.	ton	19.00
Passenger S.A.G.	ton	17.00
Natural Rubber Red Tubes	lb.	.07½
Natural Rubber Black Tubes	lb.	.06¼
Butyl Rubber Tubes	lb.	.05

Tire Fabrics

Textile Economics Bureau reports that production of tire cord and fabric (excluding chafer fabric) totaled 73 million pounds in the second quarter of 1958, a decline of 10 million pounds or 12 per cent from the first quarter level and 31 million pounds below the second quarter 1957 total of 104 million pounds.

In the second quarter of 1958, the output of nylon cord and fabric increased to 23 million pounds from the first quarter level of 16 million pounds and cotton cord output held at 2 million pounds. Rayon cord and fabric declined to 48 million pounds from the first quarter level of 65 million pounds.

Chafer fabric production in the second quarter of 1958 has been set at 8 million pounds compared with 10 million pounds in the first quarter of the year and 10 million pounds in the second quarter of 1957. The second quarter 1958 figure included 2 million pounds of synthetic fiber chafers and 6 million pounds of cotton.

Rayon-Nylon Battle

Current reports have it that nylon producers are annoyed at the promotion given Tyrex rayon tire cord. The rayon industry is said to be advertising Tyrex cord as a new discovery. Nylon people say that rayon cord similar to Tyrex has been in use for two years.

Chemstrand, a leading nylon cord producer, states that some members of the tire industry have been making "misleading claims" and "questionable arguments" in promoting rayon cord tires.

The running controversy between rayon and nylon tire cord is only part of an over-all battle for markets which finds producers on both sides of the line selling hard and promoting heavily. Some months ago, rayon manufacturers seemed to be losing out. Now they see a good chance of stemming the nylon tide and possibly winning back some lost ground. The coming months will tell the story.

(Prices f.o.b. Shipping Point)

Rayon Tire Cord

1100	lb.	.73
1650	lb.	.67
2200	lb.	.67½

Nylon Tire Cord

220	lb.	1.95
840	lb.	1.70

Rayon Graded Fabric

1100	lb.	.69
1650	lb.	.63½
2200	lb.	.63

Cotton Chafers

8.9 oz. (per square yard)	lb.	.68
9.25 oz. (per square yard)	lb.	.66
11.65 oz. (per square yard)	lb.	.62
14.4 oz. (per square yard)	lb.	.71

Liquid Latex

Natural: According to the Rubber Manufacturers Association a total of 54,227 long tons of natural latex were imported into the United States in the first ten months of 1958. This compares with the 63,017 long tons imported in the first ten months of the previous year.

In the first ten months of 1958, says RMA, a total of 51,525 long tons of natural rubber latex were consumed against the 62,543 long tons consumed in the first ten months of 1957. As of October 31, 1958, there were 9,931 long tons of natural latex in stocks.

It now appears as if 65,000 long tons of natural latex will be imported in 1958 and that about 68,000 long tons will be consumed. In 1957, 72,252 long tons were in new supply and 75,009 long tons were consumed.

Natural rubber latex is now selling at a 38 to 39c per pound level at East Coast ports in car load lots. It does not appear as if this price level will be materially changed in the first few months of 1959.

Synthetics: Producers of synthetic latex are passing about the customary warnings at this time of year so that necessary steps will be taken to keep latex from freezing in transit or storage. Consumers are advised to take note.

It now seems that 75,000 tons of synthetic latex will be produced in 1958 compared with the 96,445 long tons produced in the previous year. Consumption in 1958 should be in the order of 72,000 long tons against 88,074 long tons in 1957.

Cotton

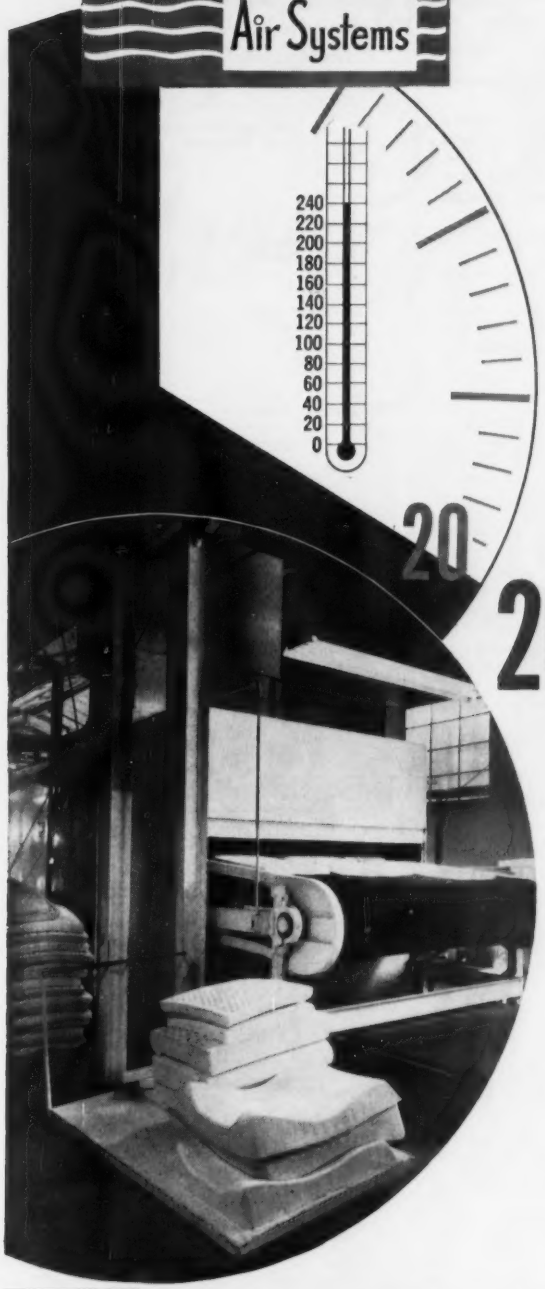
The price of middling uplands on the New York Cotton Exchange moved in the extremely narrow range of 30 points since our last report (November 3), high for the period being 36.40c reached on November 3 and again on November 5, and low being 36.10c reached on November 21 and on 4 other days during the period. The average price of middling uplands for the month of November was 36.24c based on 17 trading days. This compares with an average of 36.23c in the previous month.

The Department of Agriculture has hinted that the nation may be swamped by the 1959 cotton crop. Acreage planted to cotton in 1959 will be up substantially because of the end of the soil bank and because of the start of "Choice" program of 1958. Under the "Choice" program, farmers can get increase in acreage if they are willing to take reductions in price supports.

It is known that the 5 million acres coming out of the soil bank are mostly from low yielding areas. Therefore, this will have only moderate impact on the over-all picture. It is also said that the increased acreage resulting from the "Choice" program would result in lower over-all yields. In test results to date, however, the reverse has been true.

ROSS Air Systems

Engineered Atmospheres for Better Processing



This refers to a foam rubber processing installation . . . a 65 foot long by 8 foot wide Ross Continuous Dryer and Curing Unit for drying C-Foam mattresses, furniture and aircraft cushions at the American Latex Corp. plant, Hawthorne, California.

Twenty minutes of the 45 minutes total continuous processing time are critically important because it is the curing period. Here is where the carefully conceived and controlled 'Engineered Atmosphere' comes into the picture. The temperature in this zone has to be held very close to 240°F by specially designed introduction, circulation and exhausting of hot air. Timing of travel has to be just right.

20 critical minutes at 240°F

Approaching the discharge end comes a complete reversal . . . a cooling zone, where residual hot spots, which could cause spontaneous combustion of the material in storage, are eliminated by the controlled introduction and circulation of cool air.

In this installation, there are at least four important elements of an 'Engineered Atmosphere' : zoning, circulation of hot air, temperature control and cooling . . . all precision problems. Drying, curing, baking, impingement, heating, cooling . . . these are typical of the operations on which Ross Engineers have concentrated their skills for more than thirty-seven years.

M-R MIDLAND-ROSS

THE MIDLAND-ROSS GROUP OF COMPLEMENTING SERVICES

J. O. Ross Engineering, New York
John Waldron Corporation, New Brunswick, N. J.
Andrews and Goodrich, Boston
Ross Engineering of Canada Limited, Montreal
Ross Midwest Fulton, Dayton
Hartig Extruders, Mountainside, N. J.
Carrier Ross Engineering Company, Ltd., England

J. O. ROSS ENGINEERING
Division of Midland-Ross Corporation

444 Madison Avenue, New York 22, N. Y.
ATLANTA • BOSTON • CHICAGO
DETROIT • LOS ANGELES • SEATTLE

MARKET PRICES

CHEMICALS & COMPOUNDING INGREDIENTS

DECEMBER 1, 1958

Prices are, in general, f.o.b. works and cover the domestic markets only. Export prices, as a rule, are usually slightly higher, due to packing regulations, special handling, etc.

Abbreviations: bbls., barrels; c.l., carload; cyl., cylinder; dlvd., delivered; dms., drums; eqld., equalized; l.c.l., less than carload; M.B. masterbatch; min., minimum; ref., refined; sap., saponified; sp., special; syn., synthetic; t.c., tank cars.

***Trademark. †For Export Only.**

The arrangement of this section closely follows the Chemical Section of the 1957-58 RUBBER RED BOOK. Readers are referred to that edition for the correct classification of any material or brand name. Suppliers of every material are contacted for price information. However, only those materials are listed for which quotations have been furnished within the past six months. The quotations are not guaranteed and prospective purchasers should contact suppliers for information. Suppliers are requested to send current price information to the Market Editor, RUBBER AGE.

ACCELERATORS

A-1 (Thiocarbanilide)*	lb.	.74	.81
A-32*	lb.	.66	.80
A-100*	lb.	.52	.66
Accelerator No. 8*	lb.	——	1.25
Accelerator—49*	lb.	.59	.60
Accelerator 89*	lb.	——	1.20
Accelerator 108*	lb.	.92	.97
Accelerator—552*	lb.	——	2.25
Accelerator—808*	lb.	.66	.68
Accelerator—833*	lb.	1.17	1.19
Accelerator B*	lb.	——	.89
Altax*	lb.	.54	.56
Amax*	lb.	.80	.82
No. 1*	lb.	.76	.78
Ancap*(†)	lb.	.38	.40
Ancatax*(†)	lb.	.48	.50
Ancazate BU (ET & ME)*(†)	lb.	——	1.07
Ancazide ET*(†)	lb.	——	1.07
ME*(†)	lb.	——	1.14
Arazate*	lb.	——	2.25
Arquad 12*	lb.	.55	.61
Beutene*	lb.	.66	.71
Bismate, Rodform*	lb.	——	3.00
Butazate*	lb.	.87	.92
Butyl Eight*	lb.	1.10	1.35
Butyl Namate	lb.	.45	.50
Butyl, Ethyl & Methyl Zimate Slurry (50% solids content)	lb.	.85	.89
Captax*	lb.	.44	.46
C-P-B*	lb.	1.95	2.00
Cumate, Rodform*	lb.	——	1.45
Cydac*		.76	.78
DIBS*		——	.85
Diorthotolyguanidine	lb.	.69	.70
Dipac*	lb.	——	.85
Diphenylguanidine	lb.	.49	.50
El-Sixty*	lb.	.62	.69
Ethazate*	lb.	——	1.04
50D*	lb.	.87	.92
Ethyl Thiurad*	lb.	——	1.04
Ethyl Tuex*	lb.	——	1.04
Ethylac*	lb.	.93	.95
Guantal*	lb.	.62	.69
Harvex*	lb.	.70	.76
Hepteen Base*	lb.	1.85	1.90
Kure-Blend MT*	lb.	——	.70
Ledate, Rodform*	lb.	——	1.04
MBT-XXX*	lb.	.55	.57
MBTS Pellets*	lb.	.54½	.56½
Merac*	lb.	.75	1.05
Mercaptobenzothiazol	lb.	.44	.46
Mercaptobenzothiazyl Disulfide	lb.	.54	.56
Mertax*	lb.	.55	.62
Methazate*	lb.	——	1.04
Monex*	lb.	——	1.14
Mono Thiurad*	lb.	——	1.14
Morfex*	lb.	.65	.67
2-MT	lb.	.88	.90
NA-22* (for neoprene)	lb.	——	1.05
NOBS No. 1*	lb.	.76	.78
Special*	lb.	.80	.82
O-X-A-F	lb.	.55	.57
Pennac SDB*	lb.	.45	.48
Pentex*	lb.	——	1.24
Flour*	lb.	——	.30
Permalux (Neoprene)*	lb.	——	2.25
Phenex*	lb.	.60	.65
Polyac*	lb.	——	1.85
R-2 Crystals*	lb.	——	4.35
Rotax*	lb.	.55	.57
RZ-50-A*	lb.	——	1.00
B*	lb.	——	1.00
Santocure*	lb.	.76	.83
NS*	lb.	.80	.87
Selenac* (Ethyl, Methyl)	lb.	——	4.25
Seleram, Ethyl	lb.	——	3.00
Setsit-5*	lb.	.75	1.05
9*	lb.	.85	1.15
SPDX-GH*	lb.	.77	.79
GL*	lb.	1.20	1.30
Tellurac*	lb.	——	1.45
Tepidone*	lb.	.45	.48
Tetrone A*	lb.	——	1.98
Thiate A*	lb.	.88	——
B*	lb.	1.05	1.25
Thiofide*	lb.	.54	.61
S*	lb.	.64	.71
Thionex*	lb.	——	1.14
Thiotax*	lb.	.44	.51
Thiram, Ethyl	lb.	——	1.04
Methyl	lb.	——	1.14
Thiurad*	lb.	——	1.14
Thiuram E*	lb.	——	1.04
M*	lb.	——	1.14
Trimene*	lb.	.56	.62
Base*	lb.	1.03	1.10
Triphenyl Guanidine	lb.	——	.90
Tuads* (Ethyl)	lb.	——	1.04
Tuads* (Methyl)	lb.	——	1.14
Tuex*	lb.	——	1.14
Ultex*	lb.	1.15	1.20
Unads*	lb.	——	1.14
ZB*, ZE*, ZM*	lb.	——	.85
Vulcacure NB*	lb.	.45	.45
NS*	lb.	.75	1.05
TMD*	lb.	——	1.14
Z-B-X*	lb.	2.45	2.50
Zenite*	lb.	.54	.56
Zenite A*	lb.	.69	.71
Zenite Special*	lb.	.55	.57
Zetax* (uncoated)	lb.	.55	.57
Zimate* (Butyl)	lb.	.85	.89
Zimate* (Ethyl)	lb.	.85	.89
Zimate* (Methyl)	lb.	.85	.89
Ziram, Butyl	lb.	——	1.04
50% Dispersion	lb.	.85	.89
Ziram, Ethyl	lb.	——	1.04
50% Dispersion	lb.	.85	.89
Ziram, Methyl	lb.	——	1.04
50% Dispersion	lb.	.85	.89

ACTIVATORS

Blue Lead Sublimed (dlvd.)	lb.	.17¼	.18¼
Cottonseed Fatty Acids			
Drew Wecoline C*	lb.	.17¾	.19
Wochem 210*	lb.	.16¾	.19¼
211*	lb.	.16¾	.19¼
Fish Oil, Hydrogenated, Fatty Acid			
DAR-S* (dlvd.)	lb.	.12¼	.14¾
DAR-HY* (dlvd.)	lb.	.15½	.18
Hydrofol Acids* (dlvd.)	lb.	.15	.25¼
Hyfac 430* (dlvd.)	lb.	.18	.20½
Neo-Fat H.F.O.* (dlvd.)	lb.	.14½	.15¾
Neutrex* (dlvd.)	lb.	.15½	.18
Stearite*	lb.	.11¾	.14¼
Talene* (dlvd.)	lb.	.16½	.19
Lime, Hydrated			
Arrowhead*	ton	——	21.00
Marblehead*	ton	——	19.25
Sierra*	ton	——	22.50
Litharge			
Eagle-Picher* (c.l.)	lb.	.18	——
SB* (dlvd.)	lb.	——	.18½
Magnesium Oxide, Heavy			
General Magnesite 500*	lb.	.05½	.06
600*	lb.	.06½	.07
Kaiser 325*	lb.	.057	.073
Michigan No. 15*	lb.	.05¼	.06½

ACTIVATORS (Cont'd)

Magnesium Oxide, Light			
Carey Mag*	lb.	.25¼	.26
General Magnesite* (neoprene grade)	lb.	.26¾	.28¾
General Magnesite No. 101*	lb.	.23½	.24½
Genmeg MLW*	lb.	.23½	.24½
K & M* (neoprene grade)	lb.	.29¾	.30
Light Calcined Magnesia			
No. X-01*	lb.	.25¼	.26
Maglite D*	lb.	.23½	.26¼
K*	lb.	.25¾	.28¾
L*	lb.	.29¾	.30½
M*	lb.	.26¾	.30¾
Marmag*	lb.	.22½	.25
Michigan No. 30*	lb.	.25¾	.26
Neomag Powder*	lb.	.29¾	.30
Pellets*	lb.	.31¾	.32
Michigan No. 40*	lb.	.29¾	.30
Oleic Acid			
Dar-Chem* 105	lb.	.17	.19½
Drew Wecoline OO*	lb.	.17¾	.19
Emersol 210* (dlvd.)	lb.	.17¼	.19¾
Groco Red Oil	lb.	.17	.19½
Neo-Fat 92-04*	lb.	.20½	.22½
94-04*		.18½	.20½
Wochem 310, 311	lb.	.17	.19½
Palm Fatty Acids			
Groco 45*	lb.	.15¾	.18¾
Neo-Fat*	lb.	.15¾	.17¾
Wochem 280*	lb.	.15¾	.18¼
281*	lb.	.16¼	.18¾
Potassium Oleate (dms.)	lb.	.48	.73
Drew 24%*	lb.	.20	.73
Red Lead			
Eagle-Picher* (c.l.)	lb.	.19	——
No. 2 RM* (dlvd.)	lb.	——	.18½
Sodium Laurate, 75%*	lb.	.64	.89
Sodium Oleate, 75%*	lb.	.54	.79
Paste (dms.)	lb.	.39	.64
Sodium Stearate, 75%	lb.	.47	.72
Stearic Acid, Single Pressed			
Emersol 110* (dlvd.)	lb.	.16¼	.18¾
Groco 53*	lb.	.16	.18½
Neo-Fat 18-53*	lb.	.14¼	.16¾
Standard Pearlstearic* (dlvd.)	lb.	.16	.18½
Wochem 730*	lb.	.12¼	.14¾
Stearic Acid, Double Pressed			
Choice Pearlstearic* (dlvd.)	lb.	.16	.18½
Emersol 120* (dlvd.)	lb.	.16¾	.19½
Groco 54*	lb.	.16½	.19
Hydrofol Acid 444	lb.	.12¼	.14¾
Neo-Fat 18-54*	lb.	.15¼	.17¼
Wecoline 200*	lb.	.14¾	.16
1000*, 1500*	lb.	.12	.13¾
Wochem 731*	lb.	.15	.18½
Stearic Acid, Other			
Extra Pearlstearic* (dlvd.)	lb.	.17¾	.20¾
Groco*	lb.	.12¼	.14¾
Neo-Fat 18*	lb.	.18½	.20½
18-58*	lb.	.14¼	.16¾
18-61*	lb.	.16¾	.18¾
Stearex* (dlvd.)	lb.	.11¾	.13
Stearite*	lb.	.11¾	.13¾
Wecoline 300*	lb.	.15¼	.16½
Wochem 720*	lb.	.11¾	.13¾
721*	lb.	.11¾	.13¾
732*	lb.	.16½	.19
White Lead Basic Carbonate	lb.	.19	.20
White Lead Basic Sulfate	lb.	.17¼	.18¼
Zinc Laurate			
Laurex*	lb.	.33	.34
Zinc Stearate	lb.	.41	.46
Aquazinc K.C.*	lb.	.50	.55
Crown Brand*	lb.	.39	.44

Unclassified Activators

Actifat* (dms.)	lb.	——	.18
Aktone*	lb.	.21¼	.23¼
Barak*	lb.	——	.65
Curade*		.57	.59
Dibenzo G-M-F	lb.	——	2.60
D-B-A*	lb.	——	1.95
G-M-F*	lb.	——	2.60
Dibutylamine (dlvd.)	lb.	.55½	.56½
MODX*	lb.	.38	.40
Neo Fat 42-07*	lb.	.10¾	.12¼
Ridacto* (dms.)	lb.	.25	.26
Snodotte* (dlvd.)	lb.	.20¼	.22¼
Vimbra	lb.	.32	.38½
Vulklor*	lb.	.88	.98

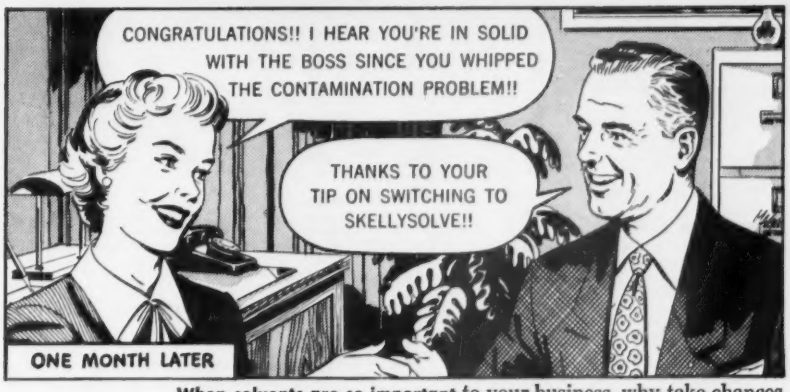
ANTI-COAGULANTS

Aqua Ammonia* (dms.)	lb.	.031	.033
M.B.M.C.* (l.c.l.)	lb.	.54	.76

The Case of The Secretary's Secret

...AND SINCE THE COMPANY I USED TO WORK FOR HAD THE SAME PROBLEM, I THOUGHT MAYBE...
WELL, DON'T KEEP IT A SECRET... I'M REALLY ON THE SPOT!!

...AND SKELLYSOLVE IS SHIPPED IN SPECIAL TANK CARS TO ELIMINATE CHANCE OF CONTAMINATION.
1. Skellysolve is quality-checked during production and before shipping.
2. Technical service backed by 25 years of Skelly experience.
3. Orders phoned direct to Skellysolve plant.
4. 9 out of 10 cars shipped next day.
5. Shipping information sent promptly.


CONGRATULATIONS!! I HEAR YOU'RE IN SOLID WITH THE BOSS SINCE YOU WHIPPED THE CONTAMINATION PROBLEM!!
THANKS TO YOUR TIP ON SWITCHING TO SKELLYSOLVE!!
ONE MONTH LATER

When solvents are so important to your business, why take chances on quality or delivery? Next time you order specify Skellysolve.

Skellysolve for Rubber and Related Industries

SKELLYSOLVE-B. For making quick-setting cements for the shoe, tape, container, tire and other industries. Quick-drying, with no foreign taste or odor in dried compound. Closed cup flash point about —25°F.

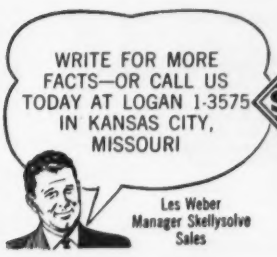
SKELLYSOLVE-C. For making quick-setting cements with a somewhat slower drying rate than those compounded with Skellysolve-B. Closed cup flash point about 13°F.

SKELLYSOLVE-H. For general use in manufacturing operations and cements, where faster evaporation rate than that of Skellysolve-C is desired. Closed cup flash point about —16°F.

SKELLYSOLVE-L. For general manufacturing operations where a medium evaporation rate is required. Closed cup flash point about 12°F.

SKELLYSOLVE-R. For general use in tire building and a variety of other manufacturing operations and cements. Reduces evaporation losses. Medium quick final dry. Lessens bloating and skinning tendency. Closed cup flash point about —25°F.

Ask about our new Skelly Petroleum Insoluble Grease.



SKELLY **Skellysolve**

SKELLY OIL COMPANY
Industrial Division
605 West 47th Street, Kansas City 41, Mo.

ANTI-FOAMING AGENTS

Aero Anti Foam H*	lb.	——	**.20**
Regular*	lb.	——	**.12**
Anhydrol 6991*	lb.	.51	**.56**
D.C. Antifoam A*	lb.	5.45	**6.65**
Antifoam A Emulsion*	lb.	2.05	2.85
Antifoam AF Emulsion*	lb.	**2.05**	**2.85**
Antifoam B*	lb.	.68	1.20
Defoama W-1701*	lb.	——	**.12½**
Defoamer A-25*	lb.	——	**3.00**
Defoamer 630*	lb.	——	**.14**
Deltyl Prime	lb.	.70	**.80**
Foam-Nix*	lb.	.50	1.25
G-E Antifoam SS-24*; 66*	lb.	5.28	6.65
60 Emulsion*	lb.	2.05	3.75
Igepol CO-210	lb.	——	**.36**
Kessco X-3* (dms.)	lb.	——	**.39**
X-180*	lb.	——	**.28**
X-181*	lb.	——	**.36½**
Nopco 1407*	lb.	.19½	**.21½**
1497-V*	lb.	.14¼	**.16¼**
1907-B*	lb.	.22½	**.24½**
JMK*	lb.	.48½	**.50½**
JMU*	lb.	.23¼	**.25¼**
JMY*	lb.	.21	**.23**
Pluronic L61*	lb.	**.33½**	**.39**
RS-968*	lb.	**.38**	**.38½**
Terpinol Prime No. 1	lb.	**.35**	**.50**
Tributyl Phosphate (dms.)	lb.	**.52½**	**.53½**
UC SAG 47*	lb.	5.25	6.50
470*	lb.	.69	1.20
VL-520*	lb.	2.68	3.50

ANTIOXIDANTS

Agebest 1293-22A*	lb.	**1.90**	**2.00**
AgeRite Alba*	lb.	2.40	2.50
Gel*	lb.	.70	.72
Hipar*	lb.	1.05	1.07
H.P.*	lb.	.79	.81
Powder*	lb.	.57	.59
Resin*	lb.	.88	.90
Resin D*	lb.	.57	.59
Spar*	lb.	.57	.59
Stalite & Stalite S*	lb.	.57	.59
Superlite*	lb.	.57	.59
White*	lb.	1.50	1.60
Akroflex C*	lb.	.85	.87
CD*	lb.	.79	.81
Alcogard 354*	lb.	1.40	1.52
Aminox*	lb.	.57	.62
Antioxidant 425*	lb.	**2.47**	**2.50**
Antioxidant 2246*	lb.	**1.50**	**1.53**
Antox*	lb.	.59	.61
Aranox*	lb.	3.25	3.30
Benzoquinone	lb.	**1.50**	**1.75**
Betanox Special*	lb.	.91	.96
B-L-E*	lb.	.57	.62
B-X-A*	lb.	.55	.57
Catalin CAO No. 1*	lb.	.91	.95
CAO No. 3*	lb.	1.05	1.07
CAO No. 5*	lb.	1.49	1.50
CAO No. 6*	lb.	——	3.20
Deenax*	lb.	.95	1.05
Di-tert-Butyl-para-Cresol	lb.	.86	1.16
Eugenol C-95%*	lb.	**2.30**	**2.50**
Flectol H*	lb.	.57	.64
Flexamine*	lb.	.79	.84
Ionol* (dms.)	lb.	**.91**	**.95**
Neozone A*	lb.	.64	.66
C*	lb.	.86	.88
D*	lb.	.57	.59
Nevastain A*	lb.	.51	.61
B*	lb.	.51	**.70**
Nullapon BF-12*	lb.	——	.21½
BF-13*	lb.	——	.25½
BF-78*	lb.	——	.55
BF-Acid*	lb.	——	.85
Octamine*	lb.	.57	.62
Oxidex*	lb.	——	**3.60**
PDA-10*	lb.	**.46**	**.48**
Permalux*	lb.	——	2.25
Polygard*	lb.	.52	.62
Santoflex AW*	lb.	.79	.86
DD*	lb.	.57	.64
75*	lb.	1.01	1.08
Santovar-A*	lb.	1.55	1.62
Santowhite Crystals*	lb.	1.55	1.62
Santowhite L*	lb.	.57	.64
MK*	lb.	1.25	1.32
Powder*	lb.	1.55	1.62
Sequestrene AA*	lb.	.70	.80
NA2*	lb.	.59	.66
NA3*	lb.	.58	.65
Stabilite*	lb.	.57	.59
Alba*	lb.	.75	.80
FLX*	lb.	.78	.80
L*	lb.	.65	.67
White*	lb.	.57	.59
White Powder*	lb.	.46	.48
Stabilizer No. 1*	lb.	**1.55**	**1.80**
Stabilizer No. 9-A*	lb.	**.80**	**1.05**
Styphen I*	lb.	**.51**	**.55**
Sunolite*	lb.	**.16**	**.22**
Tecquinol*	lb.	.82½	.84½
Tannic Acid, Tech.	lb.	**.46**	**.48**
Tenamene 3*	lb.	.91	.95
Thermoflex A*	lb.	1.05	1.07
V-G-B*	lb.	.75	.77
Wing-Stay S*	lb.	.53	.57

ANTIOZONANTS

Eastozone* 30, 31	lb.	1.05	1.07
Fura-Tone NC-1008*	lb.	.28	.39
NC-1012*	lb.	.46	.69
Santoflex AW*	lb.	.79	.86
UOP 88* & 288* (dms.)	lb.	——	1.07

ANTI-SCORCHING AGENTS

Armeen HT*	lb.	.34	.40
Good-rite Vultrol*	lb.	.67	.70
Harcopol 1183*	lb.	**.70**	**.74**
Retarder PD*	lb.	.37	.39
W*	lb.	——	.46
Sodium Acetate 60-62% Crystals	lb.	**.08**	**.08½**

ANTISEPTICS AND GERMICIDES

A.P.C. 6901*	lb.	.32	.38
Arquad S*	lb.	.38	.44
Formaldehyde (dms.)	lb.	.06	.076
G-4* (bbls.)	lb.	1.09	1.29
G-11*	lb.	1.98	2.08
Halane*	lb.	.40	.47
Ortho Cresol (26°—27°)	lb.	.14	.16¾
Preventol GD	lb.	——	1.09
Retarder D*	lb.	**.42**	**.50**
Vancide	lb.	——	.80

ANTI-WEBBING AGENTS (for Latex)

DC 7 Compound*	lb.	5.05	6.50
Webnix 34-L*	lb.	1.25	1.75
57*	lb.	1.50	2.00
69-C*	lb.	1.50	2.00
71*	lb.	1.25	1.75

AROMATICS (DEODORANTS)

Airkem 115*	gal.	——	6.50
122*	gal.	——	6.50
186*	gal.	——	6.50
Alamask AA*	lb.	——	3.00
AF*	lb.	——	2.50
AO*	lb.	——	1.50
AR*	lb.	——	.50
BG*	lb.	——	1.15
BGM*	lb.	——	.60
CY*	lb.	——	2.40
DI*	lb.	——	3.35
DL*	lb.	——	1.95
H*	lb.	——	5.50
LD*	lb.	——	.75
ND*	lb.	——	2.75
O*	lb.	——	6.50
OS*	lb.	——	5.25
Bouquet 149*	lb.	——	3.00
Coumarin*	lb.	——	3.70
Curodex 19*	lb.	**4.75**	**4.90**
188*	lb.	**5.75**	**5.90**
198*	lb.	**6.75**	**6.90**
Deodorant 65*	lb.	——	1.85
Deodorant L-37*	lb.	2.15	2.25
L-44*	lb.	2.65	2.75
N.L.T.X.*	lb.	1.90	2.00
Deodorant Oil GD 6422*	lb.	1.90	2.20
GD 6423*	lb.	1.60	1.90
GD 6575*	lb.	**2.40**	**2.90**
GD 31063*	lb.	**2.25**	**2.75**
Ethavan*	lb.	6.20	6.25
Latex Perfume 17326	lb.	——	4.00
18301	lb.	——	3.00
22258	lb.	——	2.50
Naugaromes* (dms.)	lb.	**.60**	**3.00**
Neutroleum Delta*	lb.	——	2.25
Gamma*	lb.	——	3.25
Parador A*	lb.	1.80	2.10
C*	lb.	2.00	2.50
E*	lb.	.25	.40
GD 5280*	lb.	**2.00**	**2.50**
GD 53481*	lb.	1.70	2.00
Perfume Oil Bouquet Vanilla M*	lb.	1.60	1.70
Rodo No. 0*	lb.	**4.00**	**4.50**
No. 10*	lb.	**5.00**	**5.50**
Rubbarome* (dms.)	lb.	**.60**	**3.80**
Rubber Perfume 12*	lb.	——	**4.35**
Russian Leather 7*	lb.	——	**4.35**
Vanillin	lb.	2.75	2.80

BLOWING AGENTS

Ammonium Bicarbonate	cwt.	——	**8.00**
Better Blend Soda* (c.l., bags)	cwt.	——	**2.55**
Blowing Agent No. 81105	lb.	.32	.35
Celogen*	lb.	——	**1.95**
AZ*	lb.	——	**1.95**
Diazo Amino Benzene	lb.	——	.73
Kempore R-125	lb.	——	1.95
Neo Fat 42-12*	lb.	.10¼	.12¼
Opex 40	lb.	.68	.72
Sodium Bicarbonate, U.S.P. (c.l., bags)	cwt.	——	**2.40**
Unicel ND*	lb.	——	.76
S*	lb.	——	.20
Urea	lb.	.06	.07

BONDING AGENTS

Base 6986*	lb.	**.27**	**.32**
Braze*	gal.	**6.00**	**9.00**
Chemlok 201, 203, 220, 401, 607	gal.	5.00	24.00
614	lb.	4.35	4.75
Cover Cement*	gal.	**2.50**	**4.00**
Durez 12987*	lb.	.47½	.51½
Gen-Tac Latex*	lb.	.70	.75
Hylene M*	lb.	1.70	2.00
M-50*	lb.	1.00	1.25
Penacolite B1A*	lb.	——	**.95**
R-2710*	lb.	——	**.95**
Pliobond 20*	gal.	**2.91**	**4.23**
30*	gal.	**3.65**	**4.97**

BONDING AGENTS (Cont'd)

Rex Compounds*	gal.	1.30	1.90
Thixons*	gal.	3.30	9.00
Ty-Ply Q (BN & S)*	gal.	6.75	8.00
Tygobond 30*	gal.	4.10	5.40
40*	gal.	5.80	6.89
41*	gal.	8.65	9.85
45*	gal.	5.75	6.48
Vinculux	gal.	——	4.95

COAGULANTS

Acetic Acid—56% (bbls.)	cwt.	**9.00**	**11.00**
(Glacial 99½% (dms.)	lb.	.12	.13
Calcium Nitrate, Tech. Flake	lb.	.07½	.09½
Hydroxyacetic Acid—70% (dms.)	lb.	——	.09½
Zinc Nitrate, Tech. Flake	lb.	——	.20

COLORING AGENTS

Black

Aquablak B*	lb.	.09¼	.10¾
M*	lb.	.10½	.11
S*	lb.	.11¾	.12¼
Black Shield 4*	lb.	.09	.09½
No. 5	lb.	.10	.10½
No. 6	lb.	.09	.09½
No. 19	lb.	.11	.11½
L-1404B	lb.	.10½	.11
Carbon Black—See *Reinforcing Agents*			
Cooke 1026*	lb.	——	**2.50**
Lampblack No. 10*	lb.	**.06**	**.09**
Mapico Black Iron Oxide* (50 lb. bags)	lb.	.14¾	.15
Pure Black Iron Oxide	lb.	.14¾	.14½

Blue

Akron Masterbatches*	lb.	2.23	**2.78**
Toners*	lb.	2.30	**6.35**
Blue Powders	lb.	2.20	**3.75**
Cooke M.B. Blue*	lb.	2.20	**3.75**
Disco Blues	lb.	2.20	3.45
Monastral Rubber Blue			
CPL*	lb.	1.95	1.95
PCD, Dispersed*	lb.	——	2.55
Peacoline Blue*	lb.	——	**3.85**
Ramapo Blue*	lb.	2.75	**3.00**
Rubber Blue GD* (Disp.)	lb.	——	**4.75**
Rubber Blue X-1999*	lb.	——	**1.90**
Rubber Dispersed Blues	lb.	**2.52**	**2.78**
Solfast Blue*	lb.	.75	3.60
Stan-Tone MBS*	lb.	2.20	2.85
GPE*	lb.	——	1.50
PEC*	lb.	.93	1.08
Ultramarine	lb.	**.14**	**.30**
Vansul Blue M.B.*	lb.	1.00	2.60

Brown

Brown Iron Oxide	lb.	**.15¼**	**.15½**
Mapico Brown* (50 lb. bags)	lb.	.15¾	.16
Stan-Tone GPE*	lb.	——	**3.00**
Vansul Brown M.B.* (Organic)	lb.	——	2.30

Green

Akron Masterbatches*	lb.	1.38	**3.08**
Toners*	lb.	1.35	**4.95**
Cooke M.B. Green*	lb.	1.60	**2.80**
1013*	lb.	——	**2.80**
Disco Greens	lb.	1.55	2.80
Green Powders	lb.	**1.35**	**3.95**
Monastral Rubber Green			
GSD* (Dispersed)	lb.	——	2.80
GSL*	lb.	2.20	2.20
Permansa Green CP-1236*	lb.	——	1.35
Pigment Green B*	lb.	1.45	1.45
GL-652D*	lb.	.90	.95
Ramapo Green*	lb.	——	**3.50**
Rubber Dispersed Greens	lb.	**1.23**	**3.08**
Rubber Green FD* (Disp.)	lb.	——	**2.05**
Rubber Green X-1292*	lb.	——	1.75
Solfast Green*	lb.	——	**3.95**
Stan-Tone MBS*	lb.	**1.55**	**3.35**
GPE*	lb.	——	3.00
PC*	lb.	2.20	2.25
Vansul Green M.B.*	lb.	1.50	3.00

Maroon

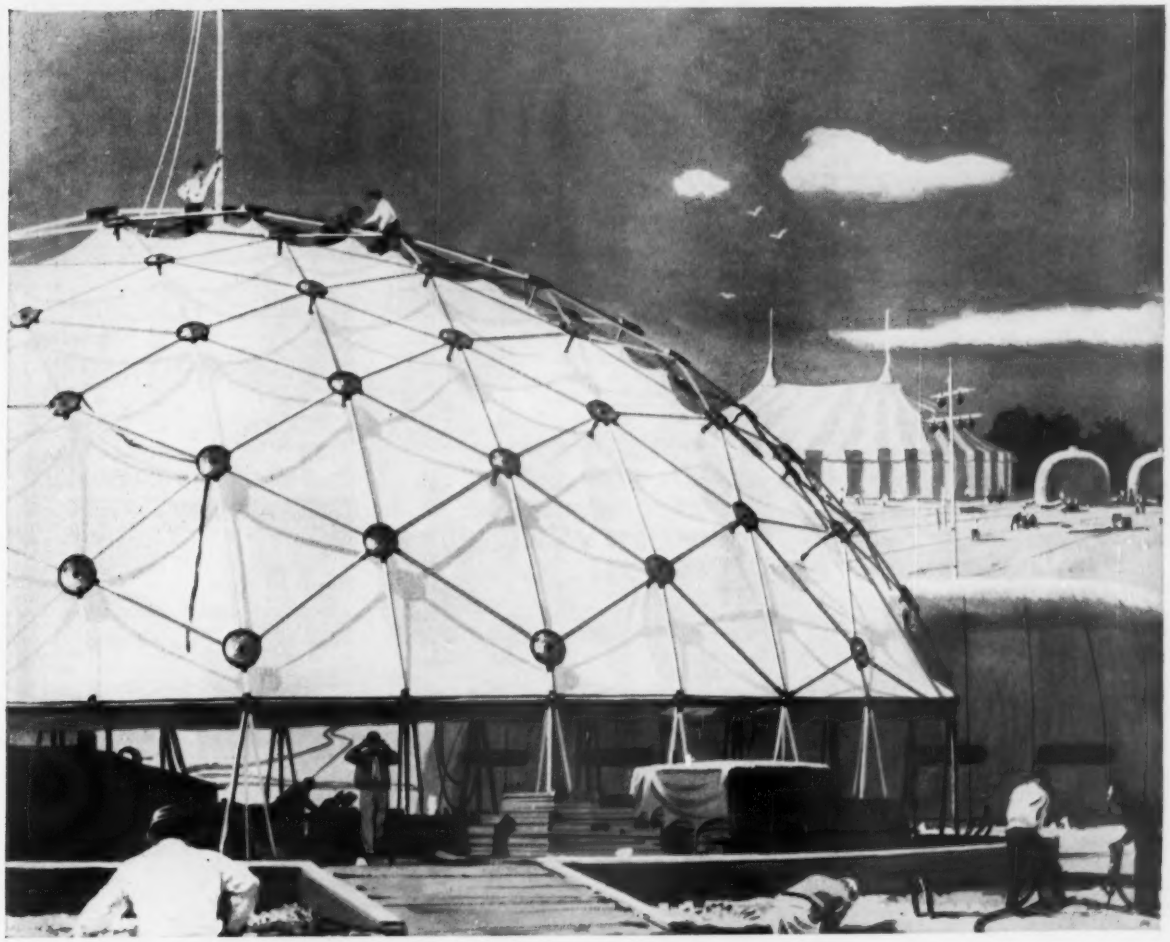
Akron Masterbatches*	lb.	——	**4.10**
Toners*	lb.	**2.00**	**4.00**
Pyrolux Maroon*	lb.	——	3.40
Vansul Maroon M.B.*	lb.	——	3.35

Orange

Akron Masterbatches*	lb.	2.42	2.77
Toners*	lb.	2.82	**4.00**
Benzidene Orange	lb.	——	3.30
Cooke MB*	lb.	**2.25**	**2.35**
1021*	lb.	——	**2.25**
Dianisidine Orange*	lb.	——	2.85
Disco Oranges	lb.	2.30	2.85
Mercadium X-2667*	lb.	——	1.61
Molybdate Orange	lb.	——	.48
Oswego Orange X2065*	lb.	——	**3.15**
Rubber Orange OD* (Disp.)	lb.	——	**2.25**
Stan-Tone Cadmium Dry*	lb.	1.85	4.23
Cadmium Paste*	lb.	2.48	2.80
GPE*	lb.	1.20	**4.35**
PC*	lb.	.75	.80
Vansul Orange M.B.*	lb.	**2.40**	**2.45**

• *"Geodesic"* structure is made of vinyl coated "Welkote," Wellington Sears nylon fabric engineered for vinyl and neoprene coating. Fabric is suspended from its rigid framework —no interior posts or supports.*

*Pat'd by R. Buckminster Fuller



"Inside-Out" Building— made with fabric

Fabric does it: a new kind of building, with its skeletal structure on the *outside!* A hose, a brake diaphragm, a radome, a truck cover. Wherever and whenever new products and processes call for new fabrics for coating and laminating, Wellington Sears answers. Over a century of experience in industrial fabrics helps make the answers come more easily. Why not bring us *your* fabric problem? For free booklet, "Fabrics Plus," write Dept. G-12.

• *For Mechanical Goods, Coated Materials, Tires, Footwear and Other Rubber Products*

WELLINGTON SEARS

FIRST In Fabrics for Industry

Wellington Sears Company, 111 W. 40th St., N.Y. 18, N.Y.

Atlanta • Boston • Chicago • Dallas • Detroit
Los Angeles • Philadelphia • San Francisco • St. Louis

WEST POINT TEXTILES

COLORING AGENTS (Cont'd)

Red

Akron Masterbatches*	lb.	1.00 -	3.53
Toners*	lb.	.88 -	5.00
Arcturus Reds*	lb.	— -	1.35
Antimony Trisulfide	lb.	.72 -	.78
R.M.P. Sulfur Free*	lb.	— -	.78
R.M.P. No. 3*	lb.	— -	.72
Brilliant Toning Reds*	lb.	1.65 -	1.90
Cadmolith Red* (dms.)	lb.	1.94 -	2.87
Cooke M.B. Red*	lb.	1.05 -	3.25
1010*	lb.	— -	1.75
Disco Reds	lb.	1.05 -	3.25
Graphic Red* (dlvd.)	lb.	.98 -	1.03
Kroma Reds*	lb.	.14 -	.15
Lake Red C*	lb.	— -	1.25
Mapico Reds* (50 lb. bags)	lb.	.14¼ -	.14½
Mercadium X-2668 Light*	lb.	— -	1.68
X-2669 Medium Light*	lb.	— -	1.76
X-2670 Medium*	lb.	— -	1.83
X-2671 Dark*	lb.	— -	1.91
Oximony Red Iron Oxide	lb.	.12¾ -	.13
Polaris Red*	lb.	— -	1.70
Recco Red Oxide*	lb.	.12 -	.13
Red Iron Oxide, Light	lb.	.13¾ -	.14
Red Powders	lb.	— -	4.40
Rubber Dispersed Reds	lb.	1.47 -	3.58
Rubber Red PBD* (Disp.)	lb.	— -	2.05
2BD, Dispersed*	lb.	— -	2.00
2BL*	lb.	1.24 -	1.24
PBL*	lb.	1.24 -	1.24
Rubanox Reds*	lb.	1.47 -	1.60
Rubber Red CP-339* (dlvd.)	lb.	— -	1.10
Rubber Red X-1148*	lb.	— -	.93
Solfast Red*	lb.	1.47 -	1.80
Stan-Tone MBS*	lb.	1.00 -	3.75
GPE*	lb.	.77 -	3.15
PC*	lb.	1.30 -	2.50
PDS*	lb.	1.40 -	1.55
PVC*	lb.	1.65 -	1.90
Vansul Red M.B.*	lb.	1.05 -	3.35
Watchung Red*	lb.	1.90 -	1.90

Tan

Mapico Tan 15* (50 lb. bags)	lb.	.23¼ -	.23½
20* (50 lb. bags)	lb.	.23¼ -	.23½

White—Lithopone

Eagle-Picher*	lb.	.0800 -	.0975
Permolith*	lb.	.0837½ -	.0912½
Sunolith*	lb.	.0800 -	.0875

White—Titanium Pigments

Iceberg*	lb.	— -	.02½
Icecap K*	lb.	— -	.03¼
Horse Head Anatase Grades*	lb.	.25½ -	.26½
Rutile Grades*	lb.	.27½ -	.28½
Stan-Tone PC*	lb.	.55 -	.60
Ti-Cal*	lb.	.09 -	.09¾
R-22*, R-25*, R-27*, R-30*	lb.	.09¾ -	.09⅞
R-60*	lb.	.09⅞ -	.10¼
Ti-Pure*	lb.	.24½ -	.27½
Anatase Grades*	lb.	.25½ -	.26½
R-100*, R-500*	lb.	.27½ -	.28½
Titanox A*—all grades (dlvd.)	lb.	.25½ -	.26½
C-50* (dlvd.)	lb.	.14⅜ -	.14⅞
RA* (dlvd.)	lb.	.27½ -	.28½
RA-10* (dlvd.)	lb.	.27½ -	.28½
RA-NC* (dlvd.)	lb.	.27½ -	.28½
RC* (dlvd.)	lb.	.09¾ -	.10¼
RC-HT* (dlvd.)	lb.	.09¾ -	.09¾
Unitane O-110*	lb.	.25½ -	.26½
O-220*	lb.	.25½ -	.26½
O-310*	lb.	.25½ -	.26½
O-410*	lb.	.25½ -	.26½
OR-150*	lb.	.27½ -	.28½
OR-250*	lb.	.27½ -	.28½
OR-340*	lb.	.27½ -	.28½
OR-342*	lb.	.27½ -	.28½
OR-350*	lb.	.27½ -	.28½
OR-540*	lb.	.27½ -	.28½
OR-640*	lb.	.27½ -	.28½
Zopaque*	lb.	.24½ -	.25½
R*	lb.	.26½ -	.27½

White—Zinc Oxide (American Process)

AZODOX 44, 45	lb.	.1450 -	.1550
AZO-ZZZ 11*, 22*, 33*, 44* 55*	lb.	.1450 -	.1550
Eagle-Picher AAA*	lb.	.1450 -	.1550
Horse Head Special*	lb.	.1450 -	.1550
XX*	lb.	.1450 -	.1550
Protox 166*	lb.	.1450 -	.1550
167*	lb.	.1450 -	.1550
267* (pelleted)	lb.	.1450 -	.1550
St. Joe Black Label*	lb.	.1450 -	.1550
Green Label*	lb.	.1450 -	.1550
Red Label*	lb.	.1450 -	.1550
Pelleted	lb.	.1450 -	.1550

COLORING AGENTS (Cont'd)

White—Zinc Oxide (Dispersed)

Dispersed Zinc Oxide	lb.	— -	.13

White—Zinc Oxide (French Process)

AZO-ZZZ 66	lb.	.1450 -	.1550
Florence Green Seal*	lb.	.1625 -	.1725
Red Seal*	lb.	.1575 -	.1675
White Seal*	lb.	.1675 -	.1775
Kadox 25*	lb.	.1675 -	.1775
15*, 17*, 72* & 515	lb.	.1450 -	.1550
Protox 168*	lb.	.1450 -	.1550
169*	lb.	.1450 -	.1550
268* (pelleted)	lb.	.1450 -	.1550
U.S.P. (cartons)	lb.	.1775 -	.1875
XX-78*	lb.	.1450 -	.1550

White—Zinc Sulfide

Cryptone ZS*	lb.	.2530 -	.2630
Lehigh 35%*	lb.	.15125-	.16125
50%	lb.	.15375-	.16375

Yellow

Akron Masterbatch*	lb.	1.12 -	2.18
Toners*	lb.	2.10 -	6.00
Benzidene-Lightfast	lb.	3.40 -	5.35
Benzidine Yellow	lb.	1.41 -	2.55
Cadmolith Yellow (dms.)	lb.	1.12 -	1.20
Chrome Yellow	lb.	.35 -	.35
Cooke M.B. Yellow 405*	lb.	2.15 -	2.75
105*	lb.	— -	2.15
Disco Yellows	lb.	2.05 -	3.95
Iron Oxide, Pure Light Shades	lb.	.12 -	.12¼
Dark Shades	lb.	.11½ -	.11¾
Mapico Yellow* (50 lb. bags)	lb.	.12 -	.12¼
Rubber Dispersed Yellows	lb.	1.27 -	2.13
Rubber Yellow GD* (disp.)	lb.	— -	2.25
GL*	lb.	— -	1.68
Rubber Yellow X-1940*	lb.	— -	2.35
Stan-Tone Cadmium Dry*	lb.	2.80 -	2.98
Cadmium Paste	lb.	1.77 -	1.79
MBS*	lb.	1.30 -	2.20
GPE*	lb.	.77 -	3.25
PC*	lb.	.55 -	3.40
Toluidine Yellow	lb.	2.20 -	2.20
YL-660 D*	lb.	1.25 -	1.35
Oximony Iron Oxide	lb.	.12¾ -	.13
Vansul Yellow M.B.*	lb.	1.15 -	2.15
Yellow Powders	lb.	2.00 -	5.00
Zinc Yellow	lb.	.29 -	.29

DISPERSING AGENTS

Anchoid*(†)	lb.	.24 -	.25
Anhydrapent*	lb.	.56 -	.59
Armeen 18*	lb.	.39 -	.45
Belloid TD*	lb.	.15¾ -	.16¾
Blancol*	lb.	— -	.15¾
Darvan No. 1*, No. 2*, No. 3*	lb.	.22 -	.30
Daxad 11* (21*, 23*)	lb.	.08 -	.30
Diethanolamine (dms., dlvd.)	lb.	.24½ -	.27
Dispersaid*	lb.	1.25 -	1.35
Emcol K-8300* (dms.)	lb.	.14 -	.18
P10-59	lb.	.32 -	—
5120	lb.	.31 -	—
5138	lb.	.31 -	—
Emulphor ON-870*	lb.	— -	.55
Furala*	lb.	.06½ -	.07½
Halloid*	lb.	.04½ -	.05½
Igepal CO-630*	lb.	— -	.29
Igepon T-73*	lb.	— -	.29½
Kyro EO* (dms.)	lb.	— -	.29¾
Leonil SA*	lb.	— -	.55
Lipal No. 9-N*	lb.	.28 -	.29
11-O*	lb.	.28 -	.29
Lomar PW*	lb.	.15¾ -	.15¾
Marasperse C*	lb.	.06¼ -	.06¾
CB*	lb.	.13 -	.15
N*	lb.	.09½ -	.10½
Monoethanolamine (dms., dlvd.)	lb.	.25 -	.27½
Naccotan A*	lb.	.16½ -	.17
Nekal BA-75*	lb.	— -	.40
BX-78*	lb.	— -	.64
Nopco 1187-X*	lb.	.15 -	.16
Pluronic F68*	lb.	.38½ -	.44
Polyfon*	lb.	.08 -	.10
R & R 551*	lb.	— -	.28
Rubbex*	lb.	.247 -	.277
Stablex B*	lb.	.50 -	.95
Stan-Chem BQC*	lb.	.12¼ -	.17¼
1067*	lb.	— -	.13½
1471*	lb.	.1687 -	.2187
2251*	lb.	.12¼ -	.17¼
Trenamine D-25*	lb.	.32½ -	.36
Triethanolamine (dms., dlvd.)	lb.	.22 -	.25½
Yelkin TT* (and TTS*)	lb.	.13 -	.16

EXTENDERS

Arco 1071-13B*	lb.	.14½ -	.15½
1073-18B*	lb.	.13½ -	.14½
1294-36B*	lb.	.11½ -	.12½
Car-Bel-Ex-A* (and B*)	lb.	— -	.14
Extender 600*	lb.	— -	.1870
Facile Gum 4A*	lb.	.48 -	.50
Millex*	lb.	— -	.07
W*	lb.	— -	.07

EXTENDERS (Cont'd)

Nopco 2271*	lb.	.16¾ -	.18¾
Polyco 418*	lb.	.17 -	.18
PR-162 Latex Extender*	lb.	— -	.182
Solvitose HDF*	lb.	.22 -	.25
Synprolac*	lb.	.16 -	.23
Synprowax*	lb.	— -	.23
Vistanex MM Grades*	lb.	— -	.35

FILLERS (Inert and Reinforcing)

Abrasives			
Carbonite*	lb.	.21½ -	1.35
Lionite*	lb.	.16 -	1.27
Pumice	lb.	.03 -	.05
Walnut Shell Grits	ton	60.00 -	110.00
Aluminum Hydrate	lb.	.031 -	.170
Kaiser Alumina*	lb.	.026 -	.059
Aluminum Silicate			
AFD*	ton	29.50 -	36.00
Aluminum Flake*	ton	29.50 -	36.00
Marter White*	ton	18.50 -	30.00
Barium Carbonate (l.c.l.)	ton	109.00 -	126.50
Barytes			
No. 1 Floated, White*	ton	55.00 -	79.85
No. 2 Floated, Unbleached*	ton	50.00 -	74.85
No. 22 Barytes* (c.l.)	ton	— -	30.00
No. 3805 Barytes*	ton	22.00 -	26.75
Foam A*	ton	— -	55.00
Sparmite*	ton	80.00 -	90.00
XIOR*	ton	80.00 -	90.00
Bentonite (c.l.)	ton	— -	13.50
Argosite Clay* (c.l.)	ton	— -	12.50
Bennett Clay* (c.l.)	ton	— -	32.50
SPV Volclay* (c.l.)	ton	— -	13.50
White Hi-Gel*	ton	— -	65.90
Blanc Fixe	ton	125.00 -	142.00
Calcium Carbonate			
Atomite* (c.l.)	ton	— -	32.50
B.I. White No. 1 (c.l.	ton	— -	10.00
Calcene NC*	ton	80.00 -	100.00
TM*	ton	82.50 -	102.50
Calwhite*	ton	— -	20.00
Camel-Carb*	ton	— -	14.00
Camel-Tex*	ton	— -	22.00
Camel-Wite*	ton	— -	35.00
CCO White*	ton	— -	22.00
Duramite*	ton	— -	20.00
Gamaco* (c.l.)	ton	— -	32.50
Georgia Marble 5-25* (c.l.)	ton	— -	20.00
No. 10 White* (c.l.)	ton	— -	11.00
Kalite*	ton	52.50 -	67.50
Laminar*	ton	— -	30.00
Lesamite* (c.l.)	ton	— -	27.50
Lorite*	ton	30.00 -	36.00
Millical*	ton	38.00 -	53.00
Multifex MM*	ton	117.50 -	137.50
Non-Fer-Al*	ton	35.00 -	50.00
Purecal M*	ton	56.75 -	80.75
SC* (and T*)	ton	110.00 -	125.00
U*	ton	120.00 -	135.00
PPTD* (c.l.)	ton	— -	30.00
Rambo No. 1*	ton	— -	11.50
Snowflake*	ton	— -	20.00
Super Multifex*	ton	167.50 -	187.50
Surfex*	ton	42.00 -	57.00
Suspenso*	ton	38.00 -	43.00
Witcarb Reg.*	ton	60.00 -	85.00
*	ton	117.50 -	140.00
R*	ton	127.50 -	150.00
RC*	ton	117.50 -	140.00
York White*	ton	— -	11.50
Calcium Silicate			
Silene EF*	lb.	.055 -	.065
Calcium Sulfate, Anhydrous			
Snow White Filler*	ton	— -	22.00
Calcium Sulfate Hydrous			
Terra Alba No. 1*	ton	— -	17.00
Chalk Whiting (l.c.l.)	lb.	.01½ -	.01¾
Recco Paris Whiting*	ton	— -	35.00
OMYA Whiting*	ton	— -	30.00
Clay			
Afton Clay*	ton	13.00 -	38.00
Aiken Clay*	ton	14.50 -	—
Alsilite* (c.l.)	ton	30.00 -	45.00
Aluminum Flake*	ton	25.50 -	28.50
Buca* (c.l.)	ton	— -	45.00
Burgess No. 20*	ton	— -	35.00
No. 30*	ton	— -	37.00
Burgess Iceberg*	ton	— -	50.00
Icecap K*	ton	— -	65.00
Catalpo* (c.l.)	ton	— -	35.00
Champion*	ton	— -	14.50
Crown*	ton	— -	14.00
Dixie* (c.l.)	ton	— -	14.50
Franklin Clay—R* (c.l.)	ton	16.00 -	41.50
G. K. Soft*	ton	11.00 -	28.00
Hardwick Clays*	ton	20.00 -	57.00
Hi-White R*	ton	14.50 -	—
Kaolloid Clay* (c.l.)	ton	— -	10.50
LGB*	ton	17.50 -	22.50
LGP*	ton	20.00 -	25.00
McNamee* (c.l.)	ton	— -	14.50
Natka 1200 (c.l.)	ton	— -	13.00
Par* (c.l.)	ton	— -	13.00
Paragon*	ton	14.50 -	19.50
Pigment 5*	ton	27.50 -	34.50
33*	ton	— -	37.00
Recco* (c.l.)	ton	— -	14.50
Swanee Clay*	ton	— -	12.50
Snobrite*	ton	— -	12.50
Suprex*	ton	14.50 -	19.50
Whitetex* (c.l.)	ton	— -	50.00
Windsor*	ton	14.50 -	39.50
4200 Clay*	ton	13.00 -	—

NEW SAVINGS OPPORTUNITY FOR VINYL COMPOUNDERS

MONSANTO BRINGS YOU 3 NEW LOW-COST PRIMARY PLASTICIZERS

You can improve your profits—lower your vinyl compounding costs—simply by formulating with Monsanto's new low-cost plasticizers: Santicizer 165, Santicizer 630 and Santicizer 631. They can replace higher-cost phthalates in your vinyl compounds—give you properties satisfactory for most applications AT SIGNIFICANT SAVINGS.

Santicizer 165, 630 and 631 are all uniform specification products. You can depend on them for consistently good results—batch after batch—from one order to the next. They have good color, low viscosity, little odor, and are available in unlimited supply.

Check these outstanding features

SANTICIZER 165

- Superior to DOP in resistance to extraction by aliphatic solvents, and in speed of vinyl fusion
- Excellent low-temperature flex
- Excellent heat and light stability
- Light color
- High tolerance for secondary plasticizers

SANTICIZER 630

- Superior to DOP in resistance to migration to nitrocellulose lacquers, and in viscosity stability of plastisols
- Low viscosity
- Light color
- Lower cost than Santicizer 165 or Santicizer 631

SANTICIZER 631

- Superior to DOP in resistance to migration to nitrocellulose lacquers and in viscosity stability of plastisols
- Low viscosity
- Light color
- Superior to Santicizer 630 in volatility, low temperature flex and tolerance for secondary plasticizers

Today, when money-saving plasticizers and service are more important than ever before, you can count on Monsanto to meet your needs exactly.

Why don't you take advantage of this timely savings opportunity and investigate new Santicizer 165, 630 and 631. Write today for your trial samples.

Santicizer: Monsanto T. M., Reg. U. S. Pat. Off.

Monsanto®

WHERE CREATIVE CHEMISTRY WORKS WONDERS FOR YOU

FOR MORE INFORMATION, SEND IN COUPON

MONSANTO CHEMICAL COMPANY
Organic Chemicals Division
Dept. PL-14, St. Louis 24, Mo.
Please send technical information on new Santicizer 165, Santicizer 630 and Santicizer 631.

NAME.....

COMPANY.....

STREET ADDRESS.....

CITY..... ZONE..... STATE.....

FILLERS (Cont'd)

Diatomaceous Earth	ton	30.00	- 50.00
Celite 270	ton	55.00	-121.00
292	ton	36.00	- 95.00
Kaylorite* (c.l.)	ton	—	- 30.00
Lorite*	ton	—	- 36.00
Flock			
Cotton (White)	lb.	.26	- .28
Colored	lb.	.12	- .26
Filfloc F 40-9000*	lb.	—	- .13
F 6000*	lb.	—	- .36
Polycel*	ton	110.00	-210.00
Rayon, Bleached or Dyed	lb.	.75	- 1.20
Rayon, Grey	lb.	—	- .18
Rayon, Pink	lb.	—	- .20
Solka-Floc* (l.c.l.)	lb.	.07	- .16
Glue, Amber	lb.	.17	- .19
Ground Softwood Bark			
Silvacon* (c.l.)	ton	55.00	-100.00
Leather			
Flour (dust)	lb.	.12	- .15
Shredded	lb.	.05	- .17
Lignin	lb.	.06	- .08
Indulin*	lb.	.06	- .08
Limestone, Pulverized	ton	3.00	- 5.00
Asbestol Regular*	ton	27.00	- 29.00
Asbestol Superfine*	ton	32.00	- 34.00
Georgia Marble No. 10*	ton	—	- 11.00
Industrial Filler No. 100*	ton	—	- 7.75
Micro Velva A*	ton	49.00	- 51.00
L*	ton	57.00	- 59.00
No. 1 White*	ton	—	- 11.00
Magnesium Carbonate	lb.	.10½	- .13
K & M Clearcarb*	lb.	—	- .14
Technical* (c.l., eqld.)	lb.	.10½	- .12
Marinco CL*	lb.	—	- .17
Magnesium Silicate (see Talc)			
Mica	lb.	.01¼	- .07 ⅛
Concord*	lb.	.08	- .08¾
Micro-Mica*	lb.	.08	- .08¾
Mineralite* (c.l.)	ton	40.00	- 85.00
Silversheen*	lb.	.08	- .08¾
Triple A Mica* (c.l.)	ton	—	- 35.00
Vermiculite*	lb.	—	- .11
Wet Ground Biotite Mica	lb.	.06½	- .07¼
Wet Ground Mica No. 160*	lb.	.08	- .08¾
Pecan Shell Flour Stan Shell*	ton	45.00	- 75.00
Pyrophyllite			
No. 261*	ton	—	- 11.50
Pyrax A* (c.l.)	ton	14.50	- 15.00
WA* (c.l.)	ton	17.00	- 17.50
Sawdust, Graded	ton	14.00	- 35.00
Silica	ton	16.00	- 27.00
Extra Fine (bags) (c.l.)	ton	—	- 43.00
Slate, Powdered (l.c.l.)	ton	15.00	- 20.00
Lo-Micron Slate Flour*	lb.	—	- .04½
No. 133 Slate Flour*	ton	—	- 4.55
Sodium Silico Aluminate Zeolex 23*	lb.	.06	- .07
Talc (Magnesium Silicate)			
Asbestol Regular*	ton	—	- 27.00
Eastern RC-500*	ton	—	- 32.00
No. 41*	ton	—	- 19.70
No. 549*	ton	—	- 63.00
French*	ton	—	- 59.00
No. 367*	ton	—	- 13.00
No. 1600*	ton	—	- 70.60
No. 1768*	ton	—	- 13.00
Nytal 200* (c.l.)	ton	—	- 28.00
300* (c.l.)	ton	—	- 38.00
Sierra Fibrene C-400*	ton	33.00	- 38.00
Sierra Supreme 325*	ton	48.75	- 57.25
Sierra White*	ton	20.75	- 31.75
Soapstone*	ton	—	- 13.00
Walnut Shell Flour	ton	55.00	-100.00
Agrashell*	ton	55.00	-115.00
Stan-Shell*	ton	50.00	-100.00
Whiting, Commercial	ton	—	- 7.50
Allied Whiting*	ton	10.50	- 21.50
Camel-Carb*	ton	—	- 10.00
Calwhite (c.l.)	ton	—	- 20.00
C-C-O White*	ton	—	- 22.00
Georgia Marble No. 15*	ton	—	- 20.00
No. 16*	ton	—	- 20.00
Piqua No. 1 YAA* (c.l.)	ton	10.00	- 10.00
No. 2 LS* (c.l.)	ton	10.00	- 10.00
Snowflake* (c.l.)	ton	—	- 20.00
Stan-White 325*	ton	11.50	- 14.10
Ultrasil*	lb.	.35	- .50
Veroc* (c.l.)	ton	—	- 11.50
Welco* (c.l.)	ton	—	- 10.50
York White R* (c.l)	ton	—	- 11.00
Wood Flour	ton	31.50	- 48.00

FINISHING MATERIALS, SURFACE

Besco Finishes*	gal.	2.10	- 2.35
Black Out*	gal.	4.50	- 8.00
Shellac, Orange Gum	lb.	.40	- .50
VanWax*	ga.	1.45	- 1.50

FLAME RETARDANTS

Cellulfex CFF* (dms.)	lb.	—	- .65
Chlorowax 40*	lb.	.15¼	- .17¼
50*	lb.	.16¾	- .17¾
70*	lb.	.18½	- .20
Halowax*	lb.	.36	- .46
Zinc Borate 3167*	lb.	.1920	- .2020
Zyrox Compounds*	lb.	.88	- .95½

LATEX MODIFIERS

Ludox	lb.	.15	- .16¾
OPD-101*	lb.	.29	- .36
Piccopale A-1 Emulsion	lb.	.086	- .113
Ubatol U-2001* (t.c.)	lb.	.166	- .187
U-2003* (t.c.)	lb.	.184	- .208
U-2007* (t.c.)	lb.	.166	- .187
U-3025* (c.l.)	lb.	.223	- .235
U-3040* (c.l.)	lb.	.260	- .272
U-3045* (c.l.)	lb.	.260	- .272
U-3050* (c.l.)	lb.	.195	- .207

LUBRICANTS, MOLD

Akro Gel*	lb.	—	- .165
Alipal CO-433*	lb.	—	- .20
CO-436*	lb.	—	- .24
Aluminum Stearate Crown Brand*	lb.	.37	- .42
Amine, Mixed Crude*	lb.	.19	- .25
Aquadag*	lb.	3.50	- 4.00
Aquarex D*	lb.	—	- .78
L*	lb.	—	- .94
ME*	lb.	—	- .80
MDL*	lb.	—	- .33
WAQ*	lb.	—	- .20
Armeen HT*	lb.	.34	- .40
180*	lb.	.52	- .56
Armid HT (flaked)*	lb.	.42	- .46
0*	lb.	.39	- .41
Borax, Granular (l.c.l.)	ton	89.00	- 94.00
Carbowax 4000*	lb.	.31	- .32
CD Mold Release B*	gal.	5.00	—
B-2*	gal.	5.00	—
Colite Concentrate* (dms.)	gal.	.90	- 1.15
Colite D43D*	gal.	1.15	- 1.40
Concentrex*	lb.	—	- .25
Dag Dispersions No. 197*	lb.	1.85	- 2.90
D.C. 7 Compound*	lb.	5.05	- 6.50
D.C. Emulsion No. 7*	lb.	1.59	- 2.07
No. 8*	lb.	1.20	- 1.74
No. 35*	lb.	1.20	- 1.74
No. 35A*	lb.	1.20	- 1.74
No. 35B*	lb.	1.20	- 1.74
No. 36*	lb.	1.20	- 1.74
D.C. Mold Release Fluid*	lb.	3.04	- 3.61
Dri-Lube*	lb.	—	- .22
Emulsion Lubricant A80*	lb.	—	- 1.20
45*	lb.	—	- 1.20
G-E Silicone Emulsion SM-55*	lb.	1.18	- 1.74
SM-61*	lb.	1.18	- 1.74
SM-62*	lb.	1.18	- 1.74
G-E Silicone Fluid SF-92*	lb.	3.04	- 4.25
SF-96*	lb.	3.04	- 4.25
Hawkeye Flake* (dlvd.)	lb.	.15	- .15¾
HSC No. 35*	lb.	1.22	- 2.46
No. 515	lb.	1.22	- 2.46
Igepal CO-430*	lb.	—	- .29
CO-630*	lb.	—	- .29
CO-530*	lb.	—	- .29
Igepon AP-78*	lb.	—	- .48
T-33*	lb.	—	- .21
T-51*	lb.	—	- .13½
Kokobace R*	lb.	.17½	- .18½
Lipal 9-N*	lb.	.28	- .29
7-O*	lb.	.29	- .30
Lubrex	lb.	.25	- .30
Lubri-Flo*	gal.	10.00	- 12.00
Migralube*	lb.	—	- .35
ML-1027-2C*	gal.	—	- 2.65
ML-1028-2C*	gal.	—	- 2.65
Mold Lubricant No. 72 Conc.* (dms.)	gal.	—	- 1.90
Mold Lubricant No. 735* (dms.)	gal.	—	- 1.25
No. 769* (dms.)	gal.	—	- 1.20
No. 825* (dms.)	gal.	—	- 2.00
No. 856* (dms.)	gal.	—	- 1.90
No. 880* (dms.)	gal.	—	- 1.19
No. 887* (dms.)	gal.	—	- 1.80
No. 935* (dms.)	gal.	—	- 1.56
No. 956* (dms.)	gal.	—	- 2.50
No. 965* (dms.)	gal.	—	- 2.15
No. 967* (dms.)	gal.	—	- 2.40
No. 969* (dms.)	gal.	—	- 1.50
No. 975* (dms.)	gal.	—	- 2.85
No. 980* (dms.)	gal.	—	- 1.53
No. 987* (dms.)	gal.	—	- 2.45
A 187* (dms.)	gal.	—	- 1.90
A 256* (dms.)	gal.	—	- 1.20
A 988* (dms.)	gal.	—	- 2.60
Moldeze No. 3*	gal.	—	- 4.95
Mold-Brite*	gal.	—	- 1.50
Monopole Oil MD*	lb.	—	- .16
MR-22 Silicone Semi-Permanent	gal.	9.95	- 14.95
Olate Flakes*	lb.	.23½	- .24½
Orvus WA Paste* (dms.)	lb.	—	- .23¼
Plaskon Polyethylene S*	lb.	.32	- .47
Poly-Brite PE-20	lb.	.28	- .42
600	lb.	.42	- .58
Poly-Cone 125X	lb.	1.20	- 1.40
1,000	lb.	.93	- 1.06
Polyglycol 15-200*	lb.	.25	- .28¼
E4000*	lb.	.31	- .37
Prodag*	lb.	.30	- .52
Purity Flake* (dlvd.)	lb.	.18¾	- .19¾
Rubber-Flo*	gal.	1.25	- 2.00
Rubber-Glo*	gal.	—	- .94
Rusco Mold Paste*	lb.	—	- .25
Sericite* (l.c.l.)	ton	65.00	- 75.00
Silicone Oil A145*	lb.	3.22	- 3.61
A220* (dms.)	lb.	—	- 2.80
Silrex (dms.)	lb.	—	- .65
A65*	lb.	2.50	- 2.75

LUBRICANTS, MOLD (Cont'd)

Soybean Lecithin	lb.	.13	- .17
Thermalube*	lb.	—	- .13¾
UC Silicone L-45*	lb.	3.04	- 4.75
L-522*	lb.	2.68	- 3.50
LE-45*	lb.	1.20	- 1.70
LE-450*	lb.	1.20	- 1.70
Ucon Lubricants*	lb.	.26¼	- .27¼
Ulco Mold Soap*	lb.	.19	- .29

LUBRICANTS, RUBBER

Diglycol Stearate Neutral (and SE) (dms.)	lb.	—	- .25
Extrud-o-Lube*	gal.	1.33	- 1.54
G.B. Naphthenic Neutrals*	gal.	.11	- .18
Ivory Chips*	lb.	.19¾	- .20¾
Latex-Lube GR* (dlvd.)	lb.	.19¼	- .20
No. 82-A* (450 lb. dms.)	lb.	—	- .08½
Propylene Stearate (dms.)	lb.	.35	- .60

LUBRICANTS, RUBBER SURFACE

Barium Stearate	lb.	.41	- .46
Calcium Stearate	lb.	.39	- .44
Crown Brand*	lb.	.37	- .42
D.C. 7 Compound*	lb.	5.05	- 6.50
D.C. 200 Fluid*	lb.	3.04	- 3.61
ELA*	lb.	—	- .82
G-E Silicone Fluid SF-92*	lb.	3.04	- 4.25
Glycerized Lubricant*	gal.	1.25	- 1.40
Glydag B*	lb.	1.50	- 2.10
Glyso-Lube* (dms.)	lb.	—	- .14
No. 3* (dms.)	lb.	—	- .14
HSC No. 35*	lb.	1.28	- 1.34
No. 515*	lb.	1.28	- 1.34
Hydro-Zinc*	lb.	—	- .20
Latex-Lube Pigmented* (dlvd.)	lb.	.17¼	- .18¼
R-66*	lb.	—	- .16½
Liqui-Lube* (dlvd.)	lb.	—	- .16¼
N.F.* (dlvd.)	lb.	—	- .16¾
N.T.* (dlvd.)	lb.	—	- .16¼
Lubrex*	lb.	.25	- .30
Lubri-Cote	gal.	.86	- 1.00
Magnesium Stearate	lb.	.42	- .47
Crown Brand*	lb.	.40	- .45
Polyethylene Glycol	lb.	.22	- .26
Rubber Free (Concentrate)*	gal.	—	- 1.44
Jel*	lb.	.18	- .21½
Separex*	lb.	—	- .10½
Slab-Dip* (dms.)	lb.	—	- .17
Soybean Lecithin	lb.	.13	- .17
Stock-Lube*	lb.	—	- .10
UC XL-42*	lb.	3.14	- 4.75
XLE-42*	lb.	1.22	- 1.70
XLE-420*	lb.	1.22	- 1.70
Zinc Stearate	lb.	.41	- .46

MOLD CLEANERS

Actusol* (dlvd.)	gal.	1.45	- 1.65
Alkon* (dlvd.)	lb.	.16	- .16½
CA-301*	gal.	—	- 2.49
CA-302*	gal.	—	- 2.63
G-O 6910*	lb.	.38	- .40
Metso Anhydrous*	cwt.	5.70	- 7.95
Metso 99*	cwt.	5.00	- 7.25
200*	cwt.	6.70	- 8.95
Granular*	cwt.	4.45	- 6.70
Orvus Extra Granules*	lb.	.23¼	- .24¼
Polo*	lb.	.12¾	—
Rubber-Sol*	gal.	2.97	- 3.97
Shelblast*	lb.	.04	- .08¼
Sprex A.C.* (dlvd.)	lb.	.17¾	- .18¾
Zip Mold Cleaner*	gal.	1.05	- 1.55

PEPTIZING AGENTS

Peptizer P-12*	lb.	.95	- 1.25
Pepton 22 Plasticizer*	lb.	.83	- .86
65*	lb.	1.23	- 1.26
65B*	lb.	.83	- .86
Pitt-Consol 620, 640	lb.	.37	- .42
RPA 2*	lb.	—	- .85
3*	lb.	—	- .51
3 Conc.*	lb.	—	- .85
5*	lb.	—	- 1.10
6*	lb.	—	- 1.66

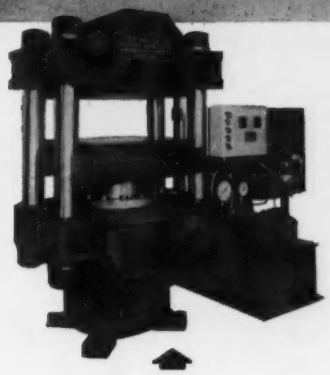
PLASTICIZERS & SOFTENERS

Acto 500*	lb.	—	- .09
Adipol BCA*	lb.	.45	- .45½
2EH*	lb.	.42½	- .43½
10A*	lb.	.42½	- .43½
ODY*	lb.	.45½	- .46½
810*	lb.	.42¼	- .45¼
XX*	lb.	.42¼	- .43½
Admex 562 (dms.)	lb.	.50¼	- .51¼
710 (dms.)	lb.	.35¼	- .36¼
711 (dms.)	lb.	.37¼	- .38¼
744 & 745 (dms.)	lb.	.41¼	- .42¼
760 (dms.)	lb.	.59¼	- .60¼
761 (dms.)	lb.	.46¼	- .47¼

. . . it costs no more for *"tailored to the job"* PRESSES

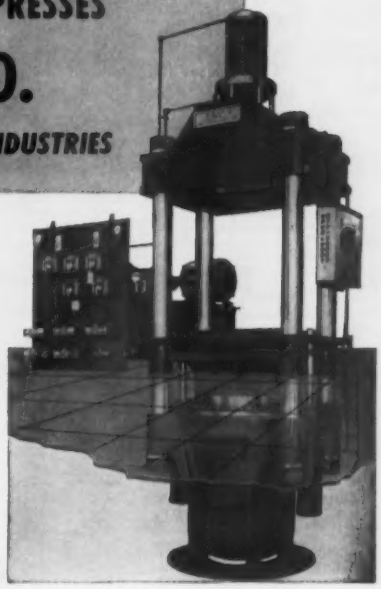
by ERIE ENGINE & MFG. CO.

for RUBBER • PLASTICS • FIBERGLASS • WOOD PRODUCTS INDUSTRIES



COMPRESSION MOLDING PRESS

EEMCO offers a complete line of heavy duty hydraulic presses for compression or transfer molding, laminating and polishing. Manufactured in all sizes, from small laboratory presses up to the largest, to suit any requirements. Also, complete installations for reinforced plastics molding. Investigate the EEMCO line, before you buy. Send us your requirements, regardless of size or capacity required. It costs no more to have EEMCO design and build presses to meet your particular requirements.



TRANSFER MOLDING PRESS

EEMCO ERIE ENGINE & MFG. CO.

950 East 12th St., ERIE, PA.

Designers and builders of a complete line of Mills and Hydraulic Presses for the RUBBER, PLASTICS, FIBERGLASS and WOOD PRODUCTS INDUSTRIES.

PLASTICS 1959

INTERNATIONAL TRADE FAIR OF THE INDUSTRY

October 17-25, 1959
Duesseldorf/West Germany

For complete information write: NOWEA, Nordwestdeutsche Ausstellungs—Gesellschaft m. b. H., Duesseldorf, Ehrenhof 4, *Telephone:* 44041, Cable Address: *NOWEA*, Duesseldorf

For information in USA:
German-American Trade Promotion Office
350 Fifth Avenue, New York 1, N. Y.
Telephone: Wisconsin 7-0727

PLASTICIZERS & SOFTENERS (Cont'd)

Anhydrol 6990*	lb.	.51	.56
Arneel SD*	lb.	.34	.40
Arolene 1980* (c.l.)	lb.	—	.10
Aromatic Plasticizer 10* (and 25*) (dms.)	lb.	.06	.07½
Aromatic Tar	gal.	.0573	.1973
Bardol*	lb.	.02¾	.03¾
B*	lb.	.06¼	.06½
Bayol D*	gal.	—	.382
F*	gal.	—	.52
Bearflex 1751*	lb.	.15	.18½
Beeswax, Bleached	lb.	.73	.75
Yellow Refined	lb.	.64	.65
Bondogen*		.55½	.60½
B.R.C. No. 20*	lb.	.0150	.0175
No. 21*	lb.	.02¾	.03
No. 22*	lb.	.02½	.02¾
B.R.H. 2*	lb.	.0213	.0351
BRS 700*	lb.	.0200	.0285
B.R.T. 3*	lb.	.0180	.0265
4*	lb.	.0250	.0260
7*	lb.	.0300	.0310
B.R.V.*	lb.	.0475	.0565
Bunarex Resins*	lb.	.07	.08
Bunatak AH*	lb.	—	.09½
N*	lb.	—	.31
U*	lb.	—	.17½
No. 90*	lb.	—	.09
No. 210*	lb.	—	.14
Butac*	lb.	.12½	.13½
Butyl Carbitol Periargonate (dms.)	lb.	—	.64½
Butyl Cellosolve Periargonate (dms.)	lb.	—	.68
Butyl Oleate	lb.	.25½	.26½
Butyl Palmitate	lb.	—	.26½
Butyl Stearate (dms.)	lb.	.22¼	.25¼
Califlux 510* (and 550*)	lb.	.02¾	.03¾
G.P.*	lb.	.01½	.02½
R-100*	lb.	.04¾	.05¾
TT*	lb.	.0193	.0293
Candelilla Wax, Prime	lb.	.53	.64
Refined Light	lb.	.56	.57
Carbowax 4000* (dms.)	lb.	.68	.70
Cardolite NC-103*	lb.	.36	.59
Carnauba Wax, Crude	lb.	.72	.74
Flaked	lb.	.73	1.25
Refined, Technical	lb.	.73	.74
Refined, Pure	lb.	.80	.88
Yellow	lb.	1.22	1.26
Celluflex* (dms.)			
112* (t.c., dlvd.)	lb.	—	.32½
179-A* (t.c., dlvd.)	lb.	—	.32½
179-C* (t.c., dlvd.)	lb.	—	.32½
179-EG* (t.c., dlvd.)	lb.	—	.32½
DBP* (t.c., dlvd.)	lb.	—	.30
DOP* (t.c., dlvd.)	lb.	—	.28½
TPP* (dms., eqld.)	lb.	—	.40
Ceresin Wax	lb.	.12	.3u
Chlorowax 40*	lb.	.15¼	.17¼
50*	lb.	.16¾	.17¾
70*	lb.	.18½	.20
LV*	lb.	.17¼	.19¼
CTLA Polymer*	gal.	.20	.36
Cumar Resins*	lb.	.07	.19
Darex DBM*	lb.	.30½	.34
DBP*	lb.	.30	.33½
DOP*	lb.	.30½	.33½
DIOP*	lb.	.30½	.33½
D.B.M.*	lb.	.32	.34½
Decylbutyl Phthalate	lb.	.27	.29½
Degras, Common	lb.	—	.14
Diallyl Phthalate	lb.	.51½	.52½
Dibenzyl Sebacate (dms.)	lb.	.93	.93½
Dibutoxyethyl Sebacate	lb.	—	.56¾
Dibutyl Phthalate (dms.)	lb.	.32½	.33½
Dibutyl Sebacate		.67½	.68
Dicapryl Adipate (dms.)	lb.	.41½	.42½
Dicapryl Phthalate (dms.)	lb.	.29	.30
Dicapryl Sebacate	lb.	.58	.59½
Di-Carbitol Phthalate (dms.)	lb.	.49	.49½
Dicyclohexyl Phthalate	lb.	.58¼	.59¼
Diethyl Phthalate (dms.)	lb.	.31½	.32½
Di-2-ethylhexyl Phthalate (dms.)	lb.	.30½	.31½
Dihexyl Adipate (dms.)	lb.	.46½	.47½
Dihexyl Phthalate (dms.)	lb.	.32½	.33½
Dihexyl Sebacate (dms.)	lb.	.66	.66½
Diisobutyl Azelate	lb.	—	.47¾
Di-iso-octyl Adipate	lb.	.42½	.43½
Dimethyl Phthalate (dms.)	lb.	.32	.33
Dimethyl Phthalate		.32	.33
Dimethyl Sebacate (dms.)	lb.	1.30	1.30½
Dinonyl Adipate	lb.	44½	47½
Dinopol 235*	lb.	.36	.37
IDO*	lb.	.31	.32
MOP*	lb.	.31½	.32½
Dioctyl Adipate (dms.)	lb.	.42½	.43½
Dioctyl Phthalate (dms.)	lb.	.30½	.31½
Dioctyl Sebacate (dms.)	lb.	.61¼	.61¾
D.I.O.P. (dms.)	lb.	.30½	.31½
Dipolymer Oil	gal.	.33	.48
Dispersing Oil No. 10*	lb.	.06	.06¼
Dutrex* 1, 6, 7	gal.	.18	.23
6H	gal.	.13	—
15E	gal.	.11	.23
20, 25	lb.	.03	.06
33	gal.	.21	.33
Elastex 10-P*	lb.	.30½	.33½
50-B*	lb.	.25	.28
DCHP*	lb.	.59	.60
Emulphor EL-719*	lb	—	.58
Epoxy Plasticizer	lb.	.33½	.36
Drapex 3.2*	lb.	.39½	.40¼
Drapex 4.4*	lb.	.34¾	.35¾
Drapex 7.7*	lb.	.37	.38

PLASTICIZERS & SOFTENERS (Cont'd)

Esparto Wax	lb.	—	.55
Estac*	lb.	—	.16
Facile Gum 4A*	lb.	.48	.50
Flexol B-400*	lb.	.27½	.28½
DOP*	lb.	.30½	.31½
TOP*	lb.	.45½	.46½
3GH*	lb.	.46	.46¾
3GO*	lb.	.55	.55¾
4GO*	lb.	.35	.36
426*	lb.	.29½	.30½
Flexricin P-1*	lb.	.33½	.36½
P-4*	lb.	.30½	.33¼
P-6*	lb.	.37	.40
P-8*	lb.	.30¼	.33¼
Fortex A* (dms.)	lb.	.12½	.14½
Fura-Tone NC-1008*	lb.	.28	.39
Galex W-100*	lb.	.15½	.19¼
G.B. Asphaltic Flux*	gal.	.0970	.1770
G.B. Light Process Oil*	lb.	.02¾	.03¾
Medium Process Oil*	lb.	.03¾	.04¾
G.B. Naphthenic Neutrals*	gal.	.12½	.21½
Good-rite GP233*	lb.	.40	.43½
GP235*	lb.	.40	.43½
GP236*	lb.	.40	.43½
GP261*	lb.	.28	.31½
GP265*	lb.	.28½	.32
GP266*	lb.	.29	.32½
GP-266-BPA*	lb.	.29	.32½
Halico C-255-NS*	gal.	.27½	.29½
C-566*	lb.	.11	.13
Harflex 300* (dms.)	lb.	.60½	.61½
325* (dms.)	lb.	.45	.46
375* (dms.)	lb.	.76	.77
500* (dms.)	lb.	.34	.35
HB20*	lb.	.15	.17
HB40*	lb.	.21	.22
Herron-H.T.*	gal.	.16	.27
Herron-Plas*	lb.	—	.03¾
Herron-Wax*	lb.	.05¼	.06
No. 23*	lb.	.08¼	.08¾
No. 24*	lb.	.07¼	.07¾
HSC No. 13*	lb.	.25	.32
No. 28 and 38*	lb.	.20	.27
Indonex 632½* (633½*, 634½*, 637½*)	gal.	.12	.19
Isooctyl Decyl Phthalate (dms.)	lb.	.31	.32
Kapsol*	lb.	.35	.35½
Kenflex A & N*	lb.	.19	.34
Kesscoflex BCL* (dms.)	lb.	—	.37
BCO* (dms.)	lb.	—	.33
BCP* (dms.)	lb.	—	.36
BCS* (dms.)	lb.	—	.32
BO* (dms.)	lb.	—	.28¼
BS* (dms.)	lb.	—	.27½
DBT* (dms.)	lb.	—	.68
DIOA* (dms.)	lb.	—	.43½
DOA* (dms.)	lb.	—	.43½
MCO* (dms.)	lb.	—	.35½
MCP* (dms.)	lb.	—	.41
MCS* (dms.)	lb.	—	.35
TRA* (dms.)	lb	—	.40
KP 23*	lb.	.31½	.32½
90*	lb.	.42½	.43½
140*	lb.	.48	.48½
201*	lb.	.58	.59
220* & 260*	lb.	.35½	.36½
666*	lb.	.59½	.60
Kremol 40*	gal.	.36	.46
50*	gal.	.39	.49
Kronisol* (dms.)	lb.	.33	.36
Kronitex AA* (dms.)	lb.	.35	.36
1* (dms.) and K-3*	lb.	.35	.36
MX*	lb.	.35	.36
Lanolin, Tech. Anhydrous	lb.	—	.20
Latex-Lube G.R.*	lb.	.19¼	.20
Lead Oleate	lb.	—	.29¾
Lindol* (dms., t.c.)	lb.	—	.32½
Locusol No. 1-6980*	lb.	.30	.34
2-Mercaptoethanol (dms.)	lb.	1.25	1.50
Methox*	lb.	.40½	.41
Methyl Laurate	lb.	.25	.27
Methyl Oleate	lb.	—	.20
Methyl Stearate (dms.)	lb.	—	.30
Monoplex DOS*	lb.	.59½	.60½
DBS*	lb.	.65½	.66½
S-70*	lb.	.41	.42
S-71*	lb.	.46½	.47½
Montan Wax, Crude	lb.	.22	.29
Flaked	lb.	.29	.29
Morflex*	lb.	.32	.69½
Natac*	lb.	.12	.13
Nebony Resins* (dms.)	lb.	.04½	.05
Neolene 210* (t.c.)	lb.	—	.16
212* (t.c.)	lb.	—	.14
220* (t.c.)	lb.	—	.15
Nerium*	lb.	—	.09
Nevillac Resins* (dms.)	lb.	.31	.85
Neville LX-880* (dms.)	lb.	.12	.13½
LX-685* (dms.)	lb.	.12½	.17½
Neville Resins* (dms.)	lb.	.07¼	.20
Nevindene Resins* (dms.)	lb.	.16½	.20
Nevinol* (dms.)	lb.	—	.24
Nuba 1* (and 2*) (dms.)	lb.	.06¾	.06¾
No. 480 Oil Proof Resin*	lb.	—	.18
Ohopex Q10* (dms.)	lb.	.30½	.31½
R9* (dms.)	lb.	.37¼	.37¾
Ortho-Nitrobiphenyl	lb.	.13	.15
Ozokerite Wax, White and Yellow	lb.	.24	.31
Paradene Resins (dms.)	lb.	.07¼	.08
No. 2 Flaked	lb.	.08	.08½
Para Flux* (dms.)	gal.	.22	.25
2016* (dms.)	gal.	.22	.26
Para Lube* (l.c.l.)	lb.	.046	.048

PLASTICIZERS & SOFTENERS (Cont'd)

Paraplex G-25*	lb.	.76	.77
G-40*	lb.	.50	.51
G-50*	lb.	.40¾	.41¾
G-53*	lb.	.45	.46
G-60* (and G-61*)	lb.	.35	.36
G-62*	lb.	.37	.38
Parmo*	lb.	.06	.13½
PG-16*	lb.	—	.35
Philrich-5* (t.c.)	gal.	—	.12½
Picco 10* (and 25*)	lb.	.15	.15½
60* (and 75*)	lb.	.14½	.15
100*	lb.	.14½	.17
Piccocizer 30*	lb.	.05½	.07
Piccolastic A* (B*, C*, D* & E*)	lb.	.24	.25
FT* (FHX* & FX*)	lb.	.1695	.1745
T-135*	lb.	.19	.20
Piccolyte S Resins*	lb.	.20½	.23½
Piccopale Resins*	lb.	.12	.13
Piccoumaron Resins*	lb.	.07	.24½
Pigmentar* Pigmentaroil*	lb.	.0460	.0634
Plastac M*	lb.	—	.09¼
Plasticizer 2286*	lb.	—	.26¼
Plasticizer 4141*	lb.	.42½	.43½
Plasticizer DP-200, DP-250, DP-520*	lb.	.45	.45¾
DP-316*	lb.	.32¾	.33½
DP-317*	lb.	.46	.47¼
DP-8732*	lb.	.44¾	.46
Plasticizer LP*	lb.	—	.07
Plasticizer MP*	lb.	—	.08
Plasticizer MT-511*	lb.	—	.68¾
Plasticizer ODN*	lb.	.35	.41
Plasticizer SC*	lb.	.42½	.43½
Plasticizer W-13*	lb.	.37	.38¾
Plastoflex 3*	lb.	—	.52
52*	lb.	.37¾	.38¾
VS*	lb.	.41¾	.42¾
Plastogen*	lb.	.08¾	.09
Plastolein 9050* (c.l.)	lb.	.54½	.56½
9055*	lb.	.30½	.32½
9058*	lb.	.48	.50
9250*	lb.	.38¼	.40¼
9715*	lb.	.39	.40
Plastone	lb.	.23	.27
Polycizer 162*	lb.	.28	.31½
332*	lb.	.29	.32½
562*	lb.	.28½	.32
662*	lb.	.29	.43½
532 and 632*	lb.	.40	.41¾
ED*	lb.	—	.31
Polyco 438*	lb.	.34	.35
Polymel C-130*	lb.	.13¾	.14¾
D*	lb.	.22½	.23½
6*	lb.	.05¼	.07¾
Poly-Sperse AP-2	lb.	.23	.29½
AP-300, LC-20	lb.	.26	.32½
Poly-Sperse R-100	lb.	.17	.23½
Process Oil C-255* (c.l.)	gal.	.27½	.29½
Propylene Stearate (dms.)	lb.	—	.32
PRR 1*	gal.	.15	.35
PT 101 Pine Tar Oil* (t.c., dms.)	lb.	.0380	.0554
400 Pine Tar* (600* & 800*) (t.c., dms.)	lb.	.0380	.0554
PX-104*	lb.	.30	.32½
PX-108*	lb.	.30½	.33
PX-138*	lb.	.32½	.33½
PX-208*	lb.	.44½	.45½
PX-238*	lb.	.44½	.45½
PX-404*	lb.	.66	.67
PX-438*	lb.	.60	.61
PX-800*	lb.	.34	.35
PX-917*	lb.	.36½	.37½
RC Plasticizer B-17* (dms.)	lb.	.23½	.24½
O-16* (dms.)	lb.	.30	.31
TG-8* (dms.)	lb.	.34½	.35½
TG-9* (dms.)	lb.	.34½	.35½
TG-85* (dms.)	lb.	.36½	.37½
RC Polymeric BGA* (dms.)	lb.	.45½	.46½
Reogen*	lb.	.14¼	.14½
465 Resin* (dms.)	lb.	.07½	.08
Resin C*	lb.	.0225	.0310
Resinex*	lb.	.03¾	.05¼
L-4*	lb.	.02¼	.03¼
Rexflex*	lb.	—	.15
Rosin Oil	gal.	.80	1.35
RR-10 (Neoprene)*	lb.	—	.37
R.S.O. Softening Oil*	lb.	.03	.05
RuBars*	lb.	.19¼	.20
Rubberol*	lb.	.18	.25¼
Santicizer B-16*	lb.	.48¼	.49¼
E-15*	lb.	.54	.55
M-17*	lb.	.46	.47
No. 140*	lb.	.35	.36
No. 141*	lb.	.36	.37
No. 160*	lb.	.29	.30
No. 602*	lb.	—	.28½
No. 603*	lb.	—	.27
Sherolatum*	lb.	.03½	.06
Staflex DBES*	lb.	.58	.60½
DOS*	lb.	.58	.60½
IXA*	lb.	.32	.35
KA*	lb.	.36	.38¾
Stan Chlor Oils*	lb.	.13½	.20½
70*	lb.	.17½	.30
Stanolind Petrolatum*	lb.	.07	.156
Wax*	lb.	.31	.33
Sunny South Burgundy Pitch*	lb.	.1030	.1085
Rosin Oil*	gal.	.58	.76
Superla Wax*	lb.	.30	.397
Syncera Wax*	lb.	.16	.267
Syn Tac* (c.l.)	gal.	—	.33
Synthetic Revertant Oil	lb.	—	.16

Now! **Replace Slow, Costly Hand-Skiving with the FIRST and ONLY practical PORTABLE SKIVER**

EASTMAN MODEL SK RUBBER SKIVER

Tried . . . and proven . . . in actual factory use. Simultaneously cuts and skives slabs up to ½ inch thick, at a fixed angle of 35° off the horizontal. Works perfectly on cured or uncured rubber, synthetic rubber, and foam. Produces a uniformly smooth and accurate cut. Automatic knife sharpener renews blade-edge as the machine is cutting.

Care to try this Eastman?

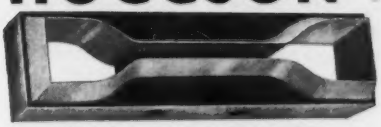
EASTMAN MACHINE COMPANY
CLeveland 5768 BUFFALO 3, NEW YORK

STRIP-CUTTERS
STRAIGHT KNIFE
and regular
ROUND KNIFE
machines available

Send for Circular
Representatives Everywhere

HOGGSON TOOLS, MOLDS, DIES

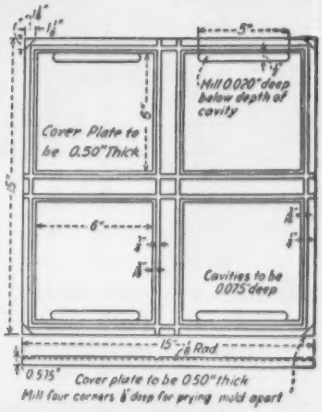
For Rubber Testing and Production



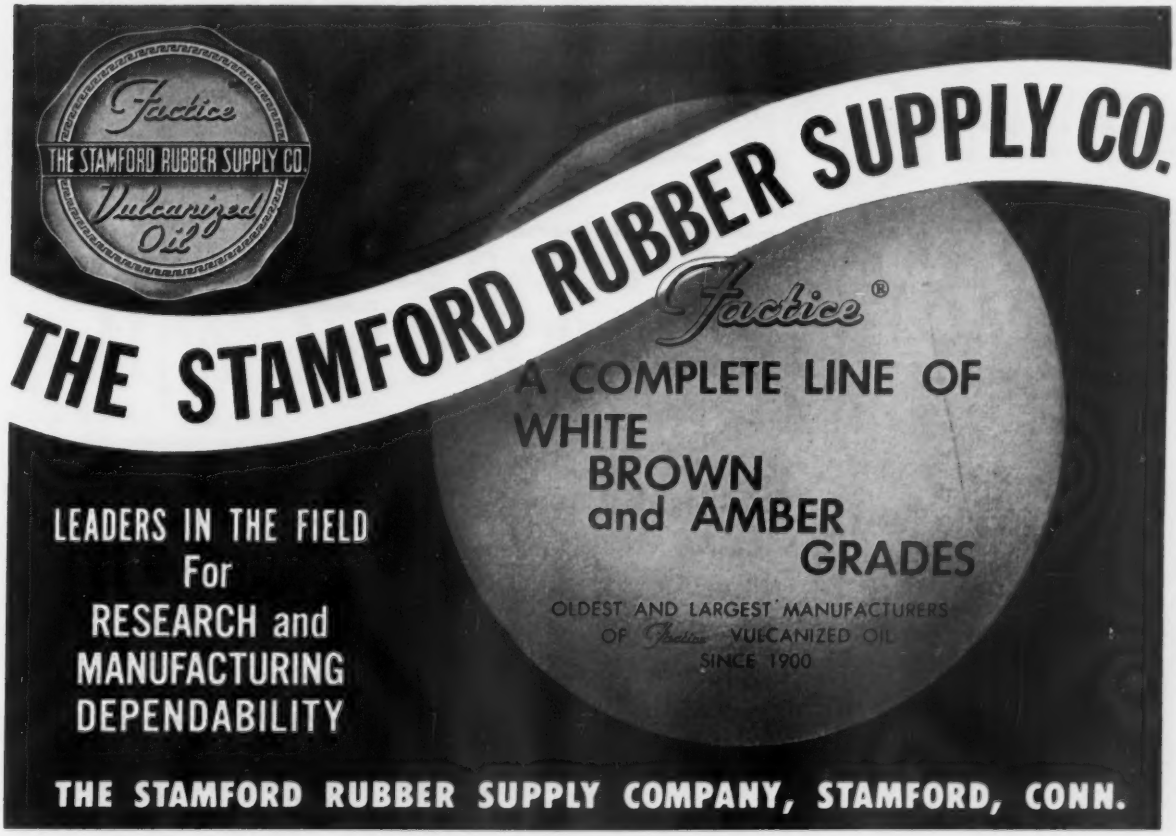
"DUMBELL" Test Strip Die D412(5IT)

For making tensile test samples, we make many types of slab molds. One is detailed at the right. These are plain or chrome finished. We usually stock molds for making adhesion, abrasion, flexing, compression and rebound test samples, but supply special molds promptly. We also furnish hand-forged tensile dies for cutting regular or tear test samples.

SLAB MOLD DIS-55


5"
Mill 0.020" deep below depth of cavity
Cover Plate to be 0.50" Thick
6"
Cavities to be 0.075 deep
15" Rod
0.515"
Cover plate to be 0.50" thick
Mill four corners ¼" deep for prying mold apart

HOGGSON & PETTIS MFG. CO., 141A Brewery St., New Haven 7, Conn.
Pac. Coast: H. M. Royal, Inc., Downey, Calif.



PLASTICIZERS & SOFTENERS (Cont'd)

Tar, Refined	gal.	.1200 -	.1760
Tarpine	lb.	.035 -	.050
Terpene A*	gal.	— -	.65
Tetraflex R-122*	lb.	.27 -	.30½
TP-90B*	lb.	.59 -	.69
TP-95*	lb.	.65 -	.75
Transphalt Resina*	lb.	.03¾ -	.05¼
Tributyl Phosphate	lb.	.52½ -	.53½
Tricresyl Phosphate	lb.	.32½ -	.36
Turgum S*	lb.	.10¾ -	.11¾
Turgum SB*	lb.	.06¾ -	.07¾
Turpol NC-1200*	lb.	.67 -	.70
NC-1300*	lb.	— -	.50
Vanadiset B*	lb.	.036 -	.07
C*	lb.	.031 -	.06
MR 80 Mesh*	lb.	.08½ -	.12½
Vistac No. 1*	gal.	1.00 -	1.21
P*	lb.	.18 -	.18½
Vopcolene 50*	lb.	— -	.31
Witcizer 100*	lb.	.26 -	.27
200*	lb.	.22¼ -	.25¼
300*	lb.	.30 -	.33½
312*, 313*	lb.	.28 -	.31½
412*	lb.	.42½ -	.46

PROCESSING AIDS

Castor Oil, Blown (dms.)	lb.	.26½ -	.27½
Refined (dms.)	lb.	— -	.18½
Castorwax*	lb.	.25 -	.31
Dutrex 7*	lb.	.12 -	.20
ELA*	lb.	— -	.82
Hydrofol Glycerides 200*	lb.	.15½ -	.19¾
Kenflex N*	lb.	.19 -	.26
Maleic Anhydride	lb.	— -	.27
Millrex*	lb.	— -	.15
Nadic Anhydride	lb.	— -	.75
Polycin*	lb.	— -	.24½
Resin No. 510*	lb.	.19 -	.26
No. 529*	lb.	.25 -	.42
Pulverized*	lb.	.20½ -	.25
Thiomalic Acid	lb.	— -	3.50
Zyrox*	lb.	.78 -	.88

PROTECTIVE & STABILIZING AGENTS

Acacia*	lb.	.12¾ -	.21
Alcogum*	lb.	.08½ -	.24
Alpha Protein	lb.	— -	.23
Arcostocrat*	lb.	— -	.07½
Carob Bean Flour	lb.	— -	.50
Casein	lb.	.22 -	.35
Emcol K-8300* (dms.)	lb.	.14 -	.18
Ethylene Diamine 68%	lb.	.44 -	.47
Gum Arabic	lb.	— -	.23
Karaya Gum	lb.	— -	.35
Locust Bean Gum	lb.	— -	.50
Prosein*	lb.	— -	.06
Stablex B*	lb.	.50 -	.95
K*	lb.	.27 -	.35

RECLAIMING AGENTS

Amalgamator Z-4*	lb.	.34 -	.35
Armeen C*	lb.	.46 -	.52
Mixed Crude*	lb.	.19 -	.25
T*	lb	.32 -	.38
Burco RA*	lb	.05 -	.081
BWH-1*	gal.	.17 -	.18
C-6 Oil* (28° & 34°)	gal.	.33 -	.38
C-10 Oil*	gal.	.25 -	.30
C-33* (t.c.)	gal.	— -	.21½
C-42* (t.c.)	gal.	— -	.23
Caustic Soda—Flake 76% (c.l., dms.)	cwt.	— -	4.50
Liquid 50% (t.c.)	cwt.	— -	2.80
Solid 76% (c.l., dms.)	cwt.	— -	4.10
Cresylic Acid (99-100%)	gal.	.85 -	1.39
D-4* (t.c.)	gal.	— -	.27
E-5* (t.c.)	gal.	— -	.25
Flake Calcium Chloride (77-80%)	ton	— -	29.00
G.B. Reclaiming Oil*	gal.	.13½ -	.21½
CD-10*	gal.	.11½ -	.19½
CD-50-U*	gal.	.19½ -	.27½
Gensol No. 6* (t.c.)	gal.	— -	.42
Heavy Aromatic Naphtha	gal.	.13¼ -	.18½
LX-77 Reclaiming Solvent*	gal.	.21 -	.33
LX-572 Reclaiming Oil*	gal.	.27 -	.32
LX-777 Reclaiming Oil*	gal.	.23 -	.33
Neo-Fat D-242*	lb.	.05½ -	.07¼
42-70*	lb.	.08¼ -	.10¼
No. 517 H.B. Oil*	gal.	.11½ -	.16½
535*	gal.	.22 -	.27
Nucom* (t.c.)	gal.	— -	.42
Pitt-Consol "500" (dms.)	lb.	.30 -	.30½
PT 101 Pine Tar Oil* (t.c., dms.)	lb.	.0380 -	.0554
Q Oil* (t.c.)	gal.	— -	.286
Reclaiming Oil 3186-G*	gal.	.26 -	.33
Reclaiming Reagent No. 1431*	lb.	.21 -	.25
R.P.A. No. 3*	lb.	— -	.51
RR-10*	lb.	— -	.37
Soda Ash (c.l., bags)	cwt.	— -	1.75
Solvent 534*	gal.	.20½ -	.26½
Solvent Oil 21*	gal.	.24 -	.29
C-42*	gal.	.23 -	.38
X-1 Resinous Oil*	lb.	.0225 -	.0325
701 Oil*	gal.	.27 -	.29

REINFORCING AGENTS—CARBON BLACK

Channel, Hard Processing (HPC) (bags)

Atlantic HPC-98*	lb.	.0775 -	.1450
Continental F*	lb.	.0775 -	.1450
Croflex*	lb.	.0775 -	.1450
Dixiedensed (and S)*	lb.	.0775 -	.1450
Kosmobile (and S)*	lb.	.0775 -	.1450
Micronex HPC*	lb.	.0775 -	.1450
Witco No. 6*	lb.	.0775 -	.1450

Channel, Medium Processing (MPC) (bags)

Arrow MPC*	lb.	.0775 -	.1350
Atlantic MPC-95*	lb.	.0775 -	.1450
Continental A*	lb.	.0775 -	.1450
Croflex TH*	lb.	.0775 -	.1450
Dixiedensed HR (and S-66)	lb.	.0775 -	.1450
Kosmobile HM (and S-66)	lb.	.0775 -	.1450
Micronex Standard*	lb.	.0775 -	.1450
Spheron 6*	lb.	.0775 -	.1450
Texas M*	lb.	.0775 -	.1450
Witco No. 1*	lb.	.0775 -	.1450

Channel, Easy Processing (EPC) (bags)

Atlantic EPC E-42*	lb.	.0775 -	.1450
Collocarb*	lb.	.0590 -	.1400
Continental AA*	lb.	.0775 -	.1450
Croflex 77*	lb.	.0775 -	.1450
Dixiedensed 77*	lb.	.0775 -	.1450
Kosmobile 77*	lb.	.0775 -	.1450
Micronex W-6*	lb.	.0775 -	.1450
Spheron 9*	lb.	.0775 -	.1450
Texas E*	lb.	.0775 -	.1450
Witco No. 12*	lb.	.0775 -	.1450
Wyex EPC*	lb.	.0775 -	.1350

Channel, Conductive (CC) (bags)

Continental R-40*	lb.	.2600 -	.3400
Dixie 5 Dustless*	lb.	.1350 -	.2100
Dixie Voltex*	lb.	.2600 -	.3400
Kosmink Dustless*	lb.	.1350 -	.2100
Kosmos Voltex*	lb.	.2600 -	.3400
Spheron C*	lb.	.1800 -	.2400
Voltex*	lb.	.2600 -	.3400

Channel, Surface Treated (STC) (bags)

Texas 109*	lb.	.0840 -	.1475

Conductive Furnace Black (CF) (bags)

Aromex CF*	lb.	.0875 -	.1450
Atlantic CF*	lb.	.0925 -	.1500
Continex CF*	lb.	.1050 -	.1550
Croflex CF*	lb.	.0925 -	.1500
Dixie CF*	lb.	.0925 -	.1500
Kosmos CF*	lb.	.0925 -	.1500
Shawinigan Acetylene Black*	lb.	— -	.1900
Vulcan C*	lb.	.1100 -	.1750

Extra-Conductive Furnace Black (ECF) (bags)

Vulcan XC-72 (pellets)*	lb.	.2500 -	.3300

Furnace, Fast Extruding (FEF) (bags)

Arovel FEF*	lb.	.0675 -	.1250
Atlantic 125*	lb.	.0675 -	.1250
Continex FEF*	lb.	.0675 -	.1250
Croflex 50*	lb.	.0675 -	.1250
Dixie 50*	lb.	.0675 -	.1250
Kosmos 50*	lb.	.0675 -	.1250
Philblack A*	lb.	.$675 -	.1250
Statex M*	lb.	.0675 -	.1250
Sterling SO*	lb.	.0675 -	.1250

Furnace, Fine (FF) (bags)

Statex B*	lb.	.0725 -	.1300
Sterling 99*	lb.	.0725 -	.1300

Furnace, General Purpose (GPF) (bags)

Arogen GPF*	lb.	.0600 -	.1175
Atlantic 118*	lb.	.0600 -	.1175
Croflex 35*	lb.	.0600 -	.1175
Dixie 35*	lb.	.0600 -	.1175
Kosmos 35*	lb.	.0600 -	.1175
Statex G*	lb.	.0600 -	.1175
Sterling V*	lb.	.0600 -	.1175
V (Non-Staining)	lb.	.0600 -	.1175

Furnace, High Abrasion (HAF) (bags)

Aromex HAF*	lb.	.0775 -	.1350
Atlantic 130*	lb.	.0775 -	.1350
Continex HAF*	lb.	.0775 -	.1350
Croflex 60*	lb.	.0775 -	.1350
Dixie 60*	lb.	.0775 -	.1350
Kosmos 60*	lb.	.0775 -	.1350
Philblack O*	lb.	.0775 -	.1350
Statex R*	lb.	.0775 -	.1350
Vulcan 3*	lb.	.0775 -	.1350

REINFORCING AGENTS—CARBON BLACK (Cont'd)

Furnace, High Modulus (HMF) (bags)

Atlantic 120*	lb.	.0625 -	.1200
Continex HMF*	lb.	.0675 -	.1200
Croflex 40*	lb.	.0625 -	.1200
Dixie 40*	lb.	.0625 -	.1200
Kosmos 40*	lb.	.0625 -	.1200
Modulex HMF*	lb.	.0625 -	.1200
Statex 93*	lb.	.0625 -	.1200
Sterling L*	lb.	.0625 -	.1200
LL*	lb.	.0625 -	.1200

Furnace, Semi-Reinforcing (SRF) (bags)

Atlantic 115*	lb.	.0575 -	.1175
Continex SRF*	lb.	.0575 -	.1150
Croflex 20*	lb.	.0575 -	.1150
Dixie 20*	lb.	.0575 -	.1150
Essex SRF*	lb.	.0575 -	.1150
Furnex*	lb.	.0575 -	.1150
Gastex*	lb.	.0625 -	.1250
Kosmos 20*	lb.	.0575 -	.1150
Pelletex*	lb.	.0575 -	.1150
NS*	lb.	.0575 -	.1150
Shawinigan Acetylene Black*	lb.	— -	.1900
Sterling NS*	lb.	.0575 -	.1150
R*	lb.	.0625 -	.1250
S*	lb.	.0575 -	.1150

Furnace Super Abrasion (SAF) (bags)

Atlantic 250*	lb.	.1150 -	.1650
Croflex 85*	lb.	.1150 -	.1650
Dixie 85	lb.	.1150 -	.1650
Kosmos 85	lb.	.1150 -	.1650
Philblack E*	lb.	.1150 -	.1725
Statex 160*	lb.	.1150 -	.1800
Vulcan 9*	lb.	.1150 -	.1800

Furnace, Super Abrasion, Intermediate (ISAF) (bags)

Aromex ISAF*	lb.	.0925 -	.1500
Atlantic 135*	lb.	.0925 -	.1500
Continex ISAF*	lb.	.0925 -	.1500
Croflex 70*	lb.	.0925 -	.1500
Dixie 70*	lb.	.0925 -	.1500
Kosmos 70*	lb.	.0925 -	.1500
Philblack I*	lb.	.0925 -	.1500
Statex 125*	lb.	.0925 -	.1500
Vulcan 6*	lb.	.0925 -	.1500

Furnace, Super Conductive (SCF) (bags)

Conductex SC*	lb.	.1150 -	.1800
Vulcan SC*	lb.	.1800 -	.2450

Thermal, Fine (FT) (bags)

P-33 (c.l.)*	lb.	— -	.0575
Sterling FT (c.l.)*	lb.	— -	.0575

Thermal, Medium (MT) (bags)

Shellblack*(†)	lb.	— -	.0250
Sterling MT (c.l.)*	lb.	— -	.0400
MT Non-Staining (c.l.)*	lb.	— -	.0500
Thermax (c.l.)*	lb.	— -	.0400
Stainless (c.l.)	lb.	—	.0500

REINFORCING AGENTS—SILICA

Cab-o-sil*	lb.	.67 -	.85
D. C. Silica (pelletized)*	lb.	1.45 -	1.65
Hi-Sil 233*	lb.	.08 -	.09½
X303*	lb.	.40 -	.45
Santocel*	lb.	.62 -	.64
Valron Estersil*	lb.	2.00 -	2.25

REINFORCING AGENTS—MISCELLANEOUS

Angelo Shellac*	lb.	.40 -	.50
Darex Copolymer No. 3*	lb.	.47 -	.49
43G*	lb.	.39 -	.41
Darex Copolymer Latex No. 3-L	lb.	.41½ -	.46
Durez 12687 (and 12707)*	lb.	.36½ -	.40
Durez 13355*	lb.	.27½ -	.31½
Good-rite Resin 2007*	lb.	.36 -	.38
2057*	lb.	.30 -	.31
Hystron*	lb.	.39 -	.41
Kralac A-EP*	lb.	.39 -	.41
Lampblack	lb.	— -	.12
Marbon S and S-1*	lb.	.36 -	.43
8000*	lb.	.36 -	.43
Marmix	lb.	.35 -	.43
Mistron Vapor*	ton	— -	70.00
HGO-55*	ton	— -	95.50
Pliolite Latex 150*	lb.	.35 -	.39
Pliolite Resin-Rubber Masterbatches*	lb.	.33 -	.57
Pliolite NR*	lb.	.93 -	.95
S6B*	lb.	.36 -	.43
Plio-Tuf G85C*	lb.	.52 -	.54
Polyco 220*	lb.	.18¼ -	.19¼
Polypol S-70*	lb.	.25 -	.26

THE ANSWER

to Every OZONE Testing Problem

OZONE TEST CHAMBERS

OREC 0300 series ozone test chambers are entirely automatically controlled with panel instrumentation directly indicating in pphm/volume the ozone concentration at which the test chamber is operating. OREC 0300 series provide ozone concentrations required by all ASTM Specifications, as well as all known Producer, Consumer, and Military Specifications.

OZONE TESTING SERVICE

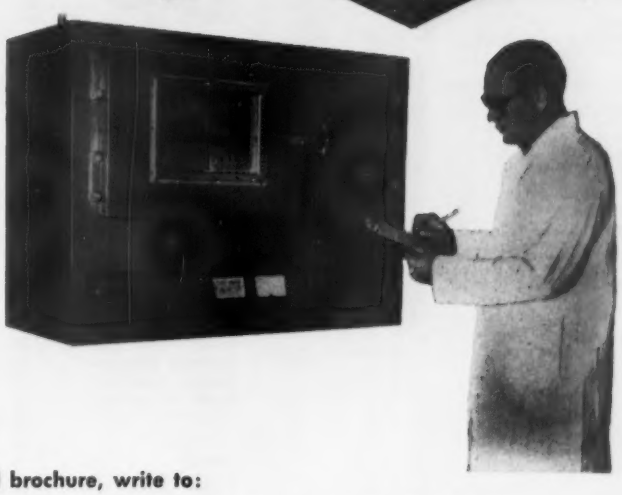
Accelerated ozone test chamber testing and Outdoor ozone testing in the stable desert climate of Phoenix, Arizona are provided at economical rates. Tests are conducted according to ASTM or customer specifications.

OTHER OZONE EQUIPMENT

Static and dynamic stretching apparatus for ozone testing, Laboratory Ozone Generators, Ozone Measurement Instrumentation, and Custom Ozone Apparatus.

AUTOMATICALLY CONTROLLED OZONE TEST CHAMBER

OZONE TESTING OF MATERIALS SERVICE



For illustrated brochure, write to:

Ozone Research and Equipment Corporation

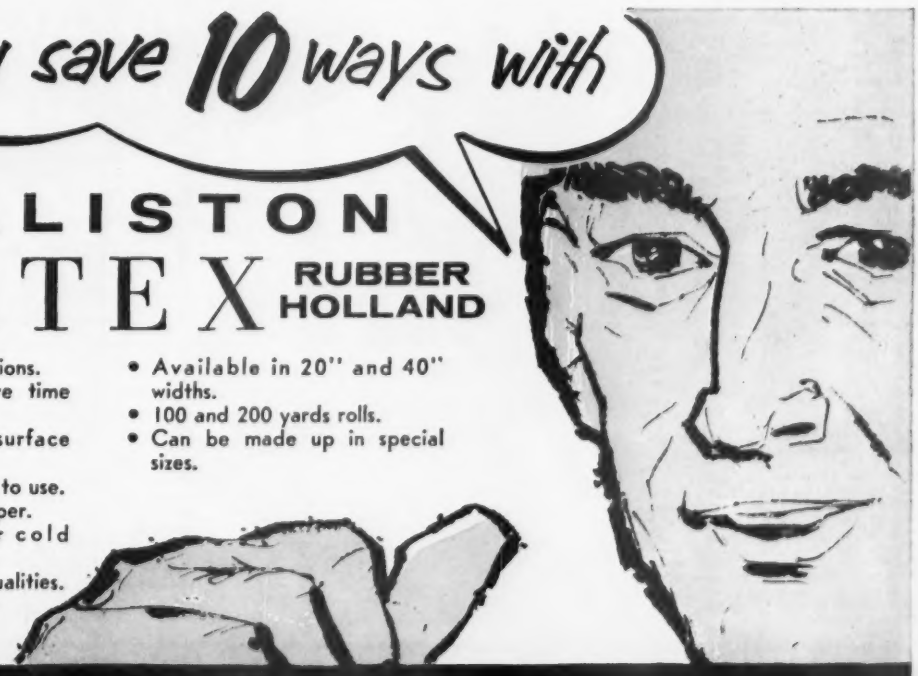
3861 W. Indian School Road **Phoenix, Arizona**

---

you save 10 ways with

HOLLISTON BRATEX RUBBER HOLLAND

- Pliable under all conditions.
- Clean peeling to save time and work.
- Retains outstanding surface gloss.
- Non-flaking and easier to use.
- Always of uniform caliper.
- For either hot or cold processing.
- Comes in 3 standard qualities.
- Available in 20" and 40" widths.
- 100 and 200 yards rolls.
- Can be made up in special sizes.



THE HOLLISTON MILLS, INC. *NORWOOD, MASS.*

NEW YORK • CHICAGO • PHILADELPHIA • MILWAUKEE • SAN FRANCISCO

RETARDERS

Benzoic Acid TBAO-2*	lb.	—	.44
Dutch Boy Normasal*	lb.	—	.46
ESEN*	lb.	.35	.37
Good-rite Vultrol*	lb.	.67	.70
Harcopol 1183*	lb.	.70	.74
Retarder J*	lb.	.62	.64
PD*	lb.	.39	.41
W*	lb.	—	.46
Retardex*	lb.	.46	.46
Wiltrol P	lb.	.39	.41

RUBBER SUBSTITUTES

Mineral Rubber

Byerlyte*	ton	50.00	57.00
Hard Hydrocarbon (dms.)*	ton	53.00	60.00
Herron Flake*	ton	—	45.00
Mineral Rubber, Solid	ton	42.50	44.50
M. R. No. 38*	ton	57.00	70.00

Vulcanized Vegetable Oils

Amberex*	lb.	.29	.36
Brown	lb.	.15	.24
Car-Bel-Lite*	lb.	—	.36
Neophax*	lb.	.17	.27
Polyrex A and C*	lb.	.12	.17
White	lb.	.15	.26
670 Brown	lb.	.14½	.14¾

Miscellaneous Rubber Substitutes

G.B. Asphaltenes*	lb.	.06	.06½
Gilsowax B*	lb.	.09	.11
Resin No. 1098 (dms.)	lb.	—	.62
No. 1198*	lb.	.46½	.49¾
Tysonite*	lb.	.26	.26¾

SOLVENTS

Acetone (dlvd.)	lb.	.11	.12
Amsco Lactol Spirits* (t.c.)	gal.	—	.20
Naphthol Spirits*	gal.	—	.19
Mineral Spirits*	gal.	—	.18
Rubber Solvent* (t.c.)	gal.	—	.19
Solv A* (t.c.)	gal.	—	.22
Solv A-80* (t.c.)	gal.	—	.23½
Solv B* (t.c)	gal.	—	.28
Solv B-90* (t.c.)	gal.	—	.31
Solv D* (t.c.)	gal.	—	.30
Solv E*	gal.	—	.30
Solv F*	gal.	—	.30
Solv F-80*	gal.	—	.32
Solv G*	gal.	—	.36
Special Naphtholite* (t.c.)	gal.	—	.19
Special Textile Spirits*	gal.	—	.20
Super Hi-Flash Naphtha*	gal.	—	.34
Super Naphtholite*	gal.	—	.19
Textile Spirits* (t.c.)	gal.	—	.20
Amyl Chlorides, Mixed (t.c.l.) (dms.)	lb.	—	.11
Benzol 90%	gal.	.36	.40
Butyl Acetate	lb.	.17	.18
Butyl Alcohol	lb.	.17	.18
Secondary (dlvd.)	lb.	.15	.16
Tertiary (dlvd.)	lb.	.15	.16
Carbon Bisulfide, Tech.	lb.	.0545	.0161
Carbon Tetrachloride	lb.	.10¼	.14¼
Cosol 1*	gal.	.37	.43
2*	gal.	.42	.48
Cyclohexane	gal.	.77	.110.00
85% (c.l.) (dms.)	gal.	—	.5n
Cyclohexanone	lb.	.29	.31½
Diacetone, Pure (dlvd.)	lb.	.15½	.16½
Dichlorethyl Ether (dms.)	lb.	.15½	.16½
Dichloropentanes (t.c.l.) (dms.)	lb.	—	.06
Dicom*	gal.	—	.35
Halowax Oil*	lb.	.28	.41
Heptanes* (t.c.)	gal.	.19	.22
Hexanes (t.c.)	gal.	.19	.22
Isopropyl Alcohol, Ref. 99% (dlvd.)	gal.	.62	.69
Ether, Ref. (dlvd.)	lb.	.09½	.10½
Mersol*	gal.	.43	.79
Mesityl Oxide (dlvd.)	lb.	.15	.16
Methyl Acetone, Syn. (dms., dlvd.)	gal.	.66	.72
Methyl Chloride	lb.	—	.12¾
Methyl Ethyl Ketone	lb.	.15	.16
Methyl Isobutyl Ketone (dlvd.)	lb.	.17	.18
Methylene Chloride	lb.	—	.12½
N-5 Pentane Mix* (t.c.)	gal.	—	.13½
N-6 Hexanes* (t.c.)	gal.	—	.14½
N-7 Hexanes* (t.c.)	gal.	—	.13½
Penetrell*	gal.	.42	.63
Perchlorethylene	lb.	—	.11
Petrolene* (t.c.)	gal.	—	.14125
Picolines, Alpha, Refined	lb.	.43½	.44
Mixed		.32½	.33
Proprietary Solvent (dms.)	gal.	.66	.77
Propyl Acetate (t.c., dlvd.)	lb	—	.11¾
Alcohol (t.c., dlvd.)	lb.	—	.11
Pyridine, Refined	lb.	.74½	.75
Quinoline	lb.	.50	.54¼
Rubber Solvent (t.c.)	gal.	—	.16
Rubsol (t.c.)	gal.	—	.12875
Skellysolve B (Hexanes)* (t.c.)	gal.	—	.158
C (Heptanes)* (t.c.)	gal.	—	.151
R (Rubber Solvent)*	gal.	—	1.29

SOLVENTS (Cont'd)

Solvent, Crude, Light	gal.	.19	.28
Solvesso 100* (t.c.)	gal.	.33	.35
150 (t.c.)	gal.	.33	—
Sunny South DD Dipentine*	gal.	.42	.63
Sunny South DD Pine Oil*	lb.	—	.15
Sunray*	gal.	.1140	.1600
Toluene (dms.)	gal.	—	.38
Toluol (t.c.)	gal.	.33	.35
Trichlorethane	lb.	—	.12¾
Triglycol Dichloride	lb.	.63	.64
Union Thinner 1* (t.c.)	gal.	—	.174
5* (dms.)	gal.	—	.199
7* (t.c.)	gal.	—	.164
2-50 W Hi-Flash*	gal.	—	.41
Xylol	gal.	.34	.38

STABILIZING AGENTS (for Vinyl Resins)

Advastab BC-12*	lb.	.90	.95
BC-74*	lb.	.70	.75
BC-105*	lb.	.75	.80
CH-101*	lb.	.60	.65
CH-201*	lb.	.60	.65
E-82*	lb.	90	.95
JCX*	lb.	.62	.67
L Paste*	lb.	.65	.70
SN*	lb.	.47	.52
T-10*	lb.	1.90	1.95
T-50-LT*	lb.	3.20	3.25
XBZ-155*	lb.	.69	.74
XC-143*	lb.	.90	.95
XE-98*	lb.	.53	.58
Barca 10*	lb.	.75	.80
Barium Ricinoleate (BVS)	lb.	—	.70
Barium Stearate	lb.	.41	.46
Basic Silicate White Lead	lb.	.16	.17
Cadmium Ricinoleate	lb.	—	2.00
Calcium Ricinoleate	lb.	—	.55
Dutch Boy DS-207*	lb.	—	.54
Plumb-O-Sil A*	lb.	—	.29¼
B*	lb.	—	.31¼
Tribase*	lb.	—	.26½
Dythal*	lb.	—	.39½
Ferro 182* (dms.)	lb.	.70	.76
200* (dms.)	lb.	1.33	1.43
203* (dms.)	lb.	.87	.91
541* (dms.)	lb.	.35½	.45½
541A* (dms.)	lb.	.82	.86
700* (dms.)	lb.	.48¼	.58¼
900* (dms.)	lb.	.90	.94
903* (dms.)	lb.	.60	.64
909* (dms.)	lb.	.91	.95
920*	lb.	—	.98
931* (dms.)	lb.	.75¼	.85¼
993* (dms.)	lb.	.89	.99
1203* (dms.)	lb.	1.30	1.40
1206* (dms.)	lb.	1.32	1.36
1820* (dms.)	lb.	.90	.94
1825* (dms.)	lb.	1.00	1.04
1976*	lb.	.47	.51
Harshaw 1-V-3*	lb.	.43	.45
1-V-4*	lb.	.66½	.70
1-V-7*	lb.	.70	.72
2-V-4*	lb.	.85	.87
2-V-7*	lb.	—	1.10
2-V-8*	lb.	—	1.30
5-V-1*	lb.	.41	.43
7-V-1*	lb.	—	.90
8-V-1*	lb.	.88	.90
8-V-5*	lb.	—	.80
8-V-100*	lb.	.82	.84
9-V-1*	lb.	.70	.72
12-V-5*	lb.	73	.75
24-V-1*	lb.	1.10	1.12
28-V-2*	lb.	—	1.18
128-V-5*	lb.	.86	.88
Lithium Stearate	lb.	.52	.57
Fluffy	lb.	.47½	.70
Standard	lb.	.52½	.75
Mark A*	lb.	2.80	3.15
C*	lb.	.81	.84
E*	lb.	.72	.75
GS*	lb.	.77	.80
M*	lb.	.59	.62
PL*	lb.	.62	.65
TT*	lb.	.72	.75
WS*	lb.	.97	1.00
X*	lb.	2.50	2.75
XI*	lb.	.87	.90
XV*	lb.	.84	.87
XX*	lb.	.57	.60
Metasap 613-A*	lb.	—	.69
613-B*	lb.	—	.84
613-C*	lb.	—	1.06
621*	lb.	—	.88
624*	lb.	—	.75
633*	lb.	—	.75
635*	lb.	—	.45
Modicol N*	lb.	.42½	.44½
S*	lb.	.30½	.32½
Sodium Silicates 41°/1:32	cwt.	1.20	2.30
Stabelan E*	lb.	1.40	1.50
XL*	lb.	.55	.65
HR-50*	lb.	.75	.90
HR Liquid*	lb.	.65	.75
HR Paste*	lb.	.85	.95
HR Powder*	lb.	.95	1.05
No. 110 Liquid	lb.	.65	.75

STABILIZING AGENTS (Cont'd)

Istabelan			
No. 115 Liquid	lb.	.85	.95
No. 120 Liquid	lb.	.65	.75
Stabilizer No. 52*	lb.	1.90	2.00
89X*	lb.	.75	.80
B-5*	lb.	—	.70
E6B*	lb.	—	.95
G-1*	lb.	1.25	1.40
HR*	lb.	.85	.89
L*	lb.	—	.60
OM-10*	lb.	—	1.95
Stafiex OY*	lb.	1.00	1.20
QXMA*	lb.	—	.70
Stayrite 10*	lb.	.36	.41
P-10*	lb.	.43	.45
15*	lb.	.55	.57
20*	lb.	.41	.46
22*	lb.	1.00	1.13
25*	lb.	.35	.40
70*	lb.	.70	.72
71*	lb.	.90	.92
75*	lb.	.61	.63
76*	lb.	.53	.55
80*	lb.	.70	.72
90*	lb.	.70	.72
95*	lb.	.70	.72
229*	lb.	.61	.63
Vanstay A* (dms.)	lb.	.50	.53
AB* (dms.)	lb.	.46	.49
CE* (dms.)	lb.	.44	.47
HT* (dms.)	lb.	.87	.90
HTA* (dms.)	lb.	.97	1.00
HTB* (dms.)	lb.	.70	.73
HTC* (dms.)	lb.	1.09	1.12
L* (dms.)	lb.	.32	.35
R* (dms.)	lb.	.67	.70
RZ-25* (dms.)	lb.	.65	.69
S* (dms.)	lb.	.57	.60
SA* (dms.)	lb.	.81	.84
W* (dms.)	lb.	1.22	1.25
X* (dms.)	lb.	.67	.70
Z* (dms.)	lb.	.62	.65

STIFFENING AGENTS

Polyac*	lb.	—	1.85
Processing Stiffener 710*	lb.	—	.88
Solvitose HDF, H. C-S, T, and E*	lb.	.22	.25
Versatil Gum 8-E*	lb.	.15	.19

SUN CHECKING AGENTS

Allied AA-1144*	lb.	.23	.24
AA-1177*	lb.	.15½	.16½
Antisol*	lb.	—	.23
Antisun* (Chipped)	lb.	.15½	.17½
(Slabbed)	lb.	.15	.17
Heliozone*	lb.	.31	.32
Microflake*	lb.	.20	.24
Nacconol NRSF*	lb.	.40½	.45
NBC*	lb.	—	1.67
Ross Sunproofing Waxes*	lb	—	.15
Sunolite*	lb.	.16	.22
127*	lb.	.16½	.20½
154*	lb.	.23	.25
Sunproof*	lb.	.31	.32
713*	lb.	.25	.26
Improved*	lb.	.25	.26
Super*	lb.	.40	.41
Jr.*	lb.	.20	.21
Tonox*	lb.	.52	.54

SURFACE ACTIVE AGENTS

Anhydrapent*	lb.	.56	.59
Anhydrol 6990*	lb.	.51	.56
6991*	lb.	.51	.56
Aquarex D*	lb.	—	.78
G*	lb.	—	.21
MDL*	lb.	—	.33
ME*	lb.	—	.80
NS*	lb.	—	.60
SMO*	lb.	—	.50
WAQ*	lb.	—	.20
Emulphor EL-620*	lb.	—	.40
EL-719*	lb.	—	.58
ON-870*	lb.	—	.55
Hyonics*	lb.	—	.28¾
Igepal CA-630	lb.	—	.29
CO-630	lb.	—	.29
CO-730	lb.	—	.29
CO-850*	lb.	—	.29
CO-880*	lb.	—	.29
Igepon CN-42*	lb.	—	.25
T-33*	lb.	—	.21
T-51*	lb.	—	.13½
T-77*	lb.	—	.49
Kessco 50201*	lb.	—	.44½
50203*	lb.	—	.44¼
18201*	lb.	—	.32
18203*	lb.	—	.35½
Lipal 9-N,* 11-0*	lb.	.28	.29
8-0,* 6-0*	lb.	.29	.30
25C,* 52C*	lb.	.34	.35
15T*	lb.	.23	.24
Pluronic L62*	lb.	.33½	.39
L64*	lb.	.33½	.39
Sellogen Gel*	lb.	—	.12¼
Soybean Lecithin	lb.	.13	.17
Synatol AV-60*	lb.	.28	.29

TACKIFIERS

Amalgamator Z-4*	lb.	.34	.35
Arceo 620-32B*	lb.	.20½	.21½
716-30*	lb.	.18½	.19½
1041-21*	lb.	.16½	.17½

TACKIFIERS (Cont'd)

Arcco A-26*	lb.	.18	.19
Bunaweld Polymer No. 780*	lb.	—	.24
No. 5514*	lb.	—	.35
Galex* (dms.)	lb.	.16	.18¾
Indopol H-300*	gal.	1.00	1.22
Koresin*	lb.	—	.95
Liquid Rubber Flux*	lb.	—	.14
Nacconal NRSF* (dlvd.)	lb.	.40½	.45
Nilox Resin* (c.l.)	cwt.	—	16.00
PR-162 Resin Emulsion (dms.)	lb.	.82	— —
Resin V	lb.	—	.23½
Synthol*	lb.	.17	.24¾
Vistac A*	lb.	.21½	.22¾
Vistanex LM Grades*	lb.	—	.45
Zirex* (c.l.)	cwt.	—	15.25

THICKENERS (For Latex)

Alcogum AN-6*	lb.	.05½	.06
AN-10*	lb.	.09	.10
AN-25*	lb.	—	.31
PA-15*	lb.	—	.16
Betanol* (dms.)	lb.	.70	.95
Gomme Labolene*	lb.	.45	.47
Good-rite K-702*	lb.	.28½	.37
K-704*	lb.	.21	.22
K-705*	lb.	.30	.39
K-707*	lb.	.18	.19
K-708*	lb.	.28	.37
K-710*	lb.	.15	.16
Hycryl A-1000* (t.l.)	lb.	.090	.100
A-2000* (t.l.)	lb.	.335	.360
Modicol VD*	lb.	.13¾	.14¼
VE*	lb.	.13¾	.14¼
Polyco 296 BT*	lb.	.15	.16
296-N*	lb.	.15	.16
530*	lb.	.15	.16
Propylene Laurate (dms.)	lb.	.57	.82
Sodium Silicate, 41°/1:3.2	cwt.	1.20	2.30
Solvitose Series*	lb.	.22	.25

VULCANIZING AGENTS

Peroxide

UC XK-1960*	lb.	5.50	—

Selenium

Vandex*	lb.	—	7.00
VA-7*	lb.	—	.50

Sulfur

Blackbird* (c.l.)	cwt.	—	2.85
Cloud* (c.l.)	cwt.	—	2.80
Crystex*	lb.	.19½	.23
Darex Dispersed Sulfur*	lb.	.14	.16
Devil A* (c.l.)	cwt.	—	2.40

VULCANIZING AGENTS (Cont'd)

Dispersed Sulfur	lb.	.14	.16
Insoluble Sulfur 60*	lb.	.12½	.13
Ko-Blend IS*	lb.	—	.39
Mist* (Wettable) (c.l.)	cwt.	—	4.00
Spider* (c.l.)	cwt.	—	2.80
Star* (c.l.)	cwt.	—	3.25
Sulfasan R*	lb.	1.55	1.57
Tire* (c.l.)	cwt.	—	2.55
Tube*)c.l.)	cwt.	—	4.40
Vultac 2*	lb.	.47	.49
3*	lb.	.51	.53

Tellurium

Telloy*	lb.	—	2.65

WETTING AGENTS

Advawet No. 10*	lb.	—	.17
No. 33*	lb.	—	.48
Aerosol 18*	lb.	.37	.42
AY*	lb.	.75	.80
MA 80%*	lb.	.40	.45
OT 75% Aqueous*	lb.	.40	.45
OT 100%*	lb.	.75	.80
OT-B*	lb.	.65	.70
Alrosol* (dms.)	lb.	.35	.41
Alrosperse*	lb.	—	.18
Anhydrol 6990* and 6991*	lb.	.51	.56
Areskap 50*	lb.	.30	.32
Dry 100*	lb.	.60	.64
Aresket Dry 300*	lb.	.60	.64
Aresklene 375*	lb.	.42	.47
Armacs*	lb.	.28	.77
Arquads*	lb.	.42	.61
Emcol 5100* (dms.)	lb.	—	.31
Energetic W-100	lb.	.28½	.35
Etho-Chemicals*	lb.	.26	.58
Ethomeen S/15*	lb.	.48	.50
T/15*	lb.	.46	.48
Kessco E-122* (dms.)	lb.	—	.45
18201*	lb.	—	.32
Kreelon 4D* (dms.)	lb.	.13	.16
8G* (dms.)	lb.	.26	.28
Kyro EO* (dms.)	lb.	—	.29¼
Modicol N*	lb.	.42½	.44½
S*	lb.	.30⅞	.32⅞
Nacconol SL* (dlvd.)	lb.	.084	.10
60S* (dlvd.)	lb.	.19	.225
Nacconol A* (dlvd.)	lb.	—	.52
Nekal WS-25	lb.	—	.38
WS-99	lb.	—	.95
Orvus AB Granules*	lb.	.16¼	.17¾
Parnol*	lb.	—	.13½
Regal Beads	lb.	.12¾	.16¾
H. D. Beads	lb.	.12¾	.15¾
Santomerse No. 3	lb.	.41	.45
S*	lb.	1.55	1.85

WETTING AGENTS (Cont'd)

Sorapon SF-73*	lb.	—	.18
SF-78*	lb.	—	.30
Sorbit P*	lb.	—	.28
Soybean Lecithin	lb.	.13	.17
Stablex G*	lb.	.50	.90
Tergitol 4* (dms., dlvd.)	lb.	.36½	.37½
7* (dms., dlvd.)	lb.	.43½	.44½
O8* (dms., dlvd.)	lb.	.36½	.37½
P28* (dms., dlvd.)	lb.	.18½	.19
Trenamine W-30	lb.	—	.13
Vultamol*	lb.	—	.17½
Wetsit Conc.*	lb.	.35	.35

MISCELLANEOUS CHEMICALS

Aquesperse 30*	lb.	—	.11
Arccopel W-18*	lb.	.17	.19
Black-Out Black, Clear & White	gal.	4.50	8.00
Chiplac Plaint	gal.	1.15	5.00
Copper Inhibitor No. 65*	lb.	—	1.57
D-Tac*	lb.	—	.22
2-Ethyl Hexanol	lb.	.23¾	.24¼
Fura-Tone Resin 1226*	lb.	.41	.43
MODX*	lb.	.38	.40
Nacconates* (dms.)	lb.	.99	3.53
Para Resins*	lb.	.04	.04½
Pigmented Filmite* (dlvd.)	lb.	.16¾	—
Resorcin, Tech.	lb.	.77½	.81½
Rio Resin*	lb.	.70	.72
Rongalite CX*	lb.	—	.21½
Sherosopes*	lb.	.13½	.18¾
Sublac Resin PX-5*	lb.	.23½	.24½
Synpep*	lb.	.54	.60
Thiokol LP-205*	lb.	—	4.00
Tysonite*	lb.	.30	.30¼
Vanfre*	gal.	2.45	3.00
No. 3* & No. 4*	gal.	1.95	2.00

SUPPLIERS

Are Your Materials Listed in the Market Prices Section? Forward full Information to Market Editor

Specialization ALWAYS MEANS THE BEST...

Stewart Bolling makes a specialty of building a moderately priced line of laboratory and medium production sizes of 2-roll, 3-roll and 4-roll calenders . . . Herringbone drive and even speed gearing develop exceptional smoothness and accuracy. Both first cost and maintenance are outstandingly low. Calenders are available in a range of sizes from 8" x 16" through 22" x 60".

Write on your letterhead for Catalog 57-A for more information on production calenders. A special Catalog 58-A describes separately our line of laboratory equipment.

12" dia. by 32" face 3-roll calender—very compact assembly on 1-piece base. Roll adjustments are individually motorized.

B STEWART BOLLING & COMPANY, INC.

3194 EAST 65th STREET • CLEVELAND 27, OHIO

• INTENSIVE MIXERS AND MILLS • CALENDERS • REFINERS • CRACKERS HYDRAULIC PRESSES • PUMP UNITS BALE SLITTERS • SPEED REDUCERS

CLASSIFIED WANT ADS

RATES:
All Classifications (except Positions Wanted):
20c per word in light face type—Minimum, $7.50
25c per word in bold face type—Minimum, $7.50
Positions Wanted: (Light face type only)
$1.00 for 20 words or less; extra words, 5c each.
When Box Number is used, add 5 words to word count

Heading on separate line, $2.00 in light face; $2.50 in bold face.
Advertisements in borders: Available in display units (multiples of ⅛ page) at display rates.
All Classified Advertising must be paid in advance except for advertisers on contract. Send check with copy.
Replies to keyed advertisements will be forwarded to advertiser without charge.

Address all replies to Box Numbers care of RUBBER AGE, 101 West 31st St., New York 1, N. Y.

Copy for January, 1959, issue must be received by Wednesday, December 24.

POSITIONS WANTED

MANUFACTURING EXECUTIVE—Graduate Engineer, age 36, married. Proven success with 17 years experience in factory management, product development, compounding, machinery design and production trouble shooting. Aggressive and full of initiative. Cost reduction through modern industrial engineering techniques. Languages. Responsible position with progressive manufacturer desired. Address Box R-284-P, RUBBER AGE.

RUBBER CHEMIST—Broad research experience in all types of vulcanizable polymers. Industry and sales oriented group leader available immediately. Ph.D., age 35, family. Address Box R-286-P, RUBBER AGE.

PRODUCTION MANAGER—Personable, aggressive, twenty-one years experience in the manufacturing of latex dipped and molded goods. Desires contact with well established company in related fields. Will consider out of country. Address Box R-283-P, RUBBER AGE.

RUBBER CHEMIST—Mechanical packings and related products, degree, 7 years experience. Working knowledge of latest polymers, research and development, lab and plant liaison, formulation, customer service, military specifications and test procedures. Sales or technical service a possibility. $8,500.00 per year. Address Box R-287-P, RUBBER AGE.

EXPORT—Overseas representative for rubber or chemical manufacturers. 15 years production and sales experience in Europe. Fluent in English, French, German, Dutch and Indonesian. Address Box R-289-P, RUBBER AGE.

FACTORY MANAGER—41 with 25 years experience hard rubber compounding and molding. 15 years experience in supervision of all phases of operations. Desires position with a progressive organization. Address Box R-291-P, RUBBER AGE.

POSITIONS WANTED—Continued

PLANT MANAGER, must relocate, 20 years diversified experience molded, extruded and dipped goods. Chemically blown and all types of solid products. Good technical background. Know all types of machinery, processes, quality control and cost reduction. Fine record in all phases of management, including personnel, labor relations and sales organization. Will relocate anywhere, but Far West or Southwest preferred. Address Box R-292-P, RUBBER AGE.

CHEMIST-COMPOUNDER, now employed, qualified, experience natural and synthetic molded goods and extrusions. Also experienced vinyls. Seeks relocation in New York-New Jersey area. Address Box R-294-P, RUBBER AGE.

RUBBER TECHNOLOGIST—Broad experience in the development of latex compounds and solvent adhesives. Good background in plant production and sales. Desires position in development or technical service and/or sales. Address Box R-295-P, RUBBER AGE.

PROCESSING SUPERINTENDENT—35 years experience in compounding of tires and mechanical goods. Experience with Banburys, mills, tubers, calenders, die making, labor training. Presently unemployed. Any reasonable offer. Go any place. Address Box R-296-P, RUBBER AGE.

PRODUCTION MANAGER—20 years experience, broad background in all phases of rubber production, extensive knowledge of custom molded mechanicals. Address Box R-298-P, RUBBER AGE.

TECHNOLOGIST—14 years experience as development engineer and chief chemist in mechanical goods field—compounding, processing, costing and technical service. Position with challenge and opportunity desired. Age 34, BChE degree. Presently employed. Address Box R-299-P, RUBBER AGE.

3 Opportunities for Chemical Engineers or Chemists

silicones

Production Supervisor First Line

Rotating shift schedule. Opportunity for rapid advancement to other technical or managerial work. BS in ChE with 2 to 5 years' manufacturing experience in a rubber industry required.

Technical Service Expert

Marketing activity providing technical service to silicone rubber customers. Field and laboratory work on material specifications, application, development and technical rubber problems. BS in ChE or Chemistry. Technical experience in rubber or silicone fields.

Process Engineer

Opportunity to work with new silicone rubber products from pilot plant through commercial production. BS, MS in chemical engineering with approximately 5 years' related experience required.

Send detailed resume in confidence to: Mr. R. L. Clark, Employee Relations Mgr.

Silicone Products Department
GENERAL ELECTRIC
Waterford, New York

HELP WANTED

PRODUCTION MANAGER
Precision molded goods manufacturer looking for well qualified man to take charge of all production. Address Box R-281-W, RUBBER AGE.

COMPOUNDER
Northern Ohio precision molded goods manufacturer looking for experienced compounder and qualified technical man. Address Box R-282-W, RUBBER AGE.

INVESTIGATE SUNNY SOUTH CAROLINA
RESEARCH DIRECTOR—Rubber and resin chemist, Ph.D. or equivalent. MECHANICAL ENGINEER with rubber, plant engineering, design and maintenance background. Send resumé today. CONTINENTAL TAPES, Cayce, S. C.

ADHESIVE CHEMIST WANTED

B.S. in Chemistry or Chemical Engineering, with some background in adhesive development and evaluation, particularly in adhesives based on synthetic elastomers and resins, rather than natural gums, casein, etc. Work will involve primarily rubber-to-metal adhesives. Two to three years experience. Salary up to $7,200, depending on qualifications. Opportunity for personal growth in expanding industry. Send resumé.

Address Box R-290-W, RUBBER AGE

EXECUTIVE TECHNICAL SALES OFFICE

Nelson EMPLOYMENT SERVICE

specialist for the "Rubber Industry"

HAROLD NELSON — 693 FIRST NATIONAL TOWER
PHONE: FRANKLIN 6-6861 — AKRON 8, OHIO

CHEMISTS — CHEMICAL ENGINEERS
ADMINISTRATIVE — TECHNICAL
Our National, Confidential Service
invites your investigation!
TOP CHEMICAL POSITIONS AT ALL LEVELS.
Call, write, or wire:—GLADYS HUNTING (Consultant)
DRAKE PERSONNEL, INC.
220 So. State St., Room 628, Chicago 4, Ill.
HArrison 7-8600

PERSONNEL CONSULTANT
specialized in rubber & component materials
Production—Sales—Chemists—Engineers
—Technical Representatives—Marketing—
Product Development—Process Supervisors
Discuss your problems with
Clem D. Easly, Special Consultant
CADILLAC ASSOCIATES, INC.
220 S. State St., Chicago 4, Ill., WA 2-4800
Call, write or wire—in confidence

For Plastisols
...LOOK TO *Borden*

ROTATIONAL CASTING • SLUSH MOLDING
DIPPING • COATING • LAMINATING

Approved formulations for these and other uses. Samples prepared to meet your specifications.
For information write or phone The Borden Company, Chemical Division, Coatings & Adhesives Dept. RA-128 103 Foster Street, Peabody, Massachusetts; or to Borden plants in Chicago, Illinois; Middlesex, New Jersey; or Toronto, Canada.

Adhesives, Coatings, Resin Emulsions, Hot Melts, Binders, Sizes and Saturants

IF IT'S A *Borden* *Chemical* IT'S GOT TO BE GOOD!

CUT GOODS

Specialists for 32 years in all types of lathe-cut goods.
Economical and reliable producers.
Also molded and extruded specialties.
Write for quotations.
MARTIN RUBBER CO., INC.
Long Branch, New Jersey
CApitol 9-1221

BUSINESS OPPORTUNITIES

ADDITIONAL CHEMICAL LINE to rubber and plastic industries wanted for New England area. Sound technical background with wide acquaintance and contacts. Address Box R-285-B, RUBBER AGE.

CONSULTANT: M. Mooney offers consultation on the rheology, viscoelasticity and general physics of rubbers and plastics. 44 Melrose Road, Mountain Lakes, N. J.

FOR SALE—A small molded goods plant in New England doing approximately $350,000.00 per year. Business is on a profitable basis and can easily be moved. No real estate involved. Address Box R-297-B, RUBBER AGE.

BLACK

Master Batching
Mixing of all kinds

BESTREAD PRODUCTS CO. — STOUGHTON, MASS.

MIXING

To Your Specification

K. B. C. INDUSTRIES, INC. — NEW HAVEN, CONN.
881 State St. — Tel: State 7-5662
Otto J. Lang, General Manager

FOR PEQUANOC
CUSTOM COMPOUNDS
CALL
AMERICAN HARD RUBBER

All the know-how of the former Pequanoc Rubber Company *plus* one hundred and eight years of rubber processing experience behind American Hard Rubber Company.

- Expert compounding and milling of all grades of soft and hard rubber.
- Top technical assistance.
- High quality, uniform, controlled mixing.

AMERICAN HARD RUBBER COMPANY
Sales Division: Ace Road, Butler, N.J.
Phone: Butler 9-1000
Plants: Tallapoosa, Ga.; Butler, N. J.

For MAXIMUM returns at minimum cost,
advertise in the Classified Columns of
RUBBER AGE

Directory of CONSULTANTS

R. R. OLIN LABORATORIES, INC.
(Established 1927)
Consultation—Development—Research for rubber and plastics industries and for raw materials suppliers for same.
P. O. Box 372RA — Akron (9), Ohio Tel HEmlock 4-3724

SOUTH FLORIDA TEST SERVICE, INC.
(Established 1931)
Corrosion, weathering and sunlight tests. Four locations in Southern Florida for inland, salt atmospheric, tidewater and total immersion exposure tests.
4301 N. W. 7th St., Miami 44, Florida

PHILIP TUCKER GIDLEY
Consulting technologist—Research, product development, formulas, factory plans, engineering, chemical and physical testing.
Fairhaven, Massachusetts

HALE AND KULLGREN, INC.
Specialists in Process and Plants for Rubber and Plastics
A Complete Engineering Service including: Economic Surveys; Process Design; Installation; Contracting and Operation.
613 E. Tallmadge Ave., Akron 10, Ohio
FRanklin 6-7161

COMPOUNDING • TROUBLE SHOOTING • TESTING
Complete staff experienced in Natural and Synthetic Rubber Technology. For a personal discussion of your problem call WAtkins 4-8800, or write to:
SNELL FOSTER D. SNELL, INC.
29 West 15th Street, New York 11, N. Y.

PELMOR LABORATORIES INC.
RESEARCH - DEVELOPMENT - PROCESSING

Hard and Soft Rubber and Plastics
Compounding and Formulation • Testing
Processing and Methods • Development Projects
Lab Planning and Organization • Molds, Mold Design
Engineering and Consulting Services.
Write: **Coleman P. Morgan, President**
401 Lafayette St. Newtown, Penna. WOrth 8-3334

50 YEARS of Producing
*** MICA WATERGROUND**
WHITE and BIOTITE
PURELY A DOMESTIC PRODUCT
Lowest priced . . . from our own larger source.
A more uniform Mica . . . preferred in the Rubber Industry for many years.
The English Mica Co.
STERLING BUILDING STAMFORD CONN

EQUIPMENT WANTED

WANTED—One used, good condition, *72" x 72"* or nearest, 1000 ton or better, three or more steam heated platens rubber press, direct from present user. Oil States Rubber Co., Arlington, Texas.

Choose MOLD LUBRICANTS with Care
for precision work • for quality • for clean release
We have over 25 varieties of Mold Lubricants, Silicone Oils, Emulsions, and non-Siliconas, which are being used by rubber and plastic manufacturers throughout the world. One of these will surely help you out of your troubles.
All Samples Now Packed In Pressure Pak Cans For Your Convenience In Testing.
For Complete Technical Data & Prices,
Write or Phone:
STONER'S INK CO.
Quarryville, Pennsylvania STerling 6-2745

SOFTENERS & PLASTICIZERS FOR RUBBER
FROM THE PINE TREE
ROSIN OILS • PINE TAR
BURGUNDY PITCH
GALEX – a non-oxidizing ROSIN
Write for our "Pine Tree Products" and "Galex" Brochures Dept. 35
NATIONAL ROSIN OIL PRODUCTS, INC.
Pioneers of the Industry
The Americas Building • Rockefeller Center • New York 20, N. Y.
Exley Avenue, Savannah, Ga.

Masterbatch colors for RUBBER BUTYL VINYL
DISCO INCORPORATED
Butler, N. J. Phone BUtler 9-1780
Midwest
O'Connor & Co., Inc.
4667 North Manor Ave.
Chicago 25, Ill.
Phone: JUniper 3-1317
New England
H. A. Schlosser & Co.
401 Industrial Trust Bldg.
Providence 1, R. I.
Phone: GAspee 1-4039

EQUIPMENT FOR SALE

4 Hydraulic Platen Presses, with 20" rams, built in 1950. 4 W & P Steam Jacketed Mixers, Z blades, worm power tilt, 200 lb. batch, with 25 hp motors. 1 16"x42" Rubber Mill, drive and 50 hp motor. Address Box R-288-S, RUBBER AGE.

FOR SALE: 3A Banbury presently in production on west coast. Available for inspection. Address Box R-293-S, RUBBER AGE.

FOR SALE: 35—Baker-Perkins #17, 200 gal., jacketed, sigma blade mixers. Some units with individual 30 HP motors, drives and screw tilts. Others with counter-weight tilts. Prices are cheaper than ever before—THEY MUST ALL GO. Phone or wire for details. PERRY EQUIPMENT CORP., 1409 N. 6th St., Philadelphia 22, Pa.

FOR SALE: 1 Baker-Perkins Mixer, 100 gal. working capacity, size 15, fully jacketed, cored sigma blades, screw power tilt, chain motor drive. 1 Thropp Mill, 18" x 48", heavy duty, top cap frame, 100 hp motor drive. 2 Robinson Ribbon Blenders, 3000 & 6000 lbs. capacity, geared-head motor drives. 1 SS Ribbon Blender, 600 lbs. capacity. 2 Paterson Ball Mills, jacketed, 6' x 5' & 5' x 5', steel lined, AC motor drives. 1 N.R.M. Extruder, 3½", 20-1 ratio, electric-oil heated, variable speed drive. 1 Royle #2 Extruder, V-belt motor drive. Hydraulic Presses. Lab Mills & Calenders. Stokes & Colton Tablet Presses. Grinders & Screens. KAHN EQUIPMENT Co., 1650 Coney Island Ave., Brooklyn 30, N. Y. Tel: Dewey 6-4640.

CALENDER: Farrel 2-roll, 10" x 17". EXTRUDERS: NRM 1½", complete plastic wire coating unit; NRM 2" Saran; Royle 3¼", 15 hp Vari-Drive; Adamson 8". INJECTION MACHINES: Watson-Stillman 4 oz. vertical; Reed-Prentice 6 oz. and 16 oz.; Impco 22 oz. HYDRAULIC PRESSES: Stokes 15 ton, Model 200D-3, full automatic; Loomis & Francis 40 ton, multi-opening; Baldwin-Southwark 75 ton; Watson-Stillman 75 ton, semi-automatic, self-contained (2); Watson-Stillman & HPM 100 ton; Elmes 200 ton; Watson-Stillman 400 ton; Farrel 625 ton. PREHEATERS: G.E. 1.5 and 5 K.W. Pelletizers, Rotary Scrap Cutters, Mills, Mixers, Banbury's, Boilers, Machine Tools, etc. HOCHMAN PLASTICS MACHINERY CORP., 151-R Mulberry St., Newark, N. J. MItchell 3-8430.

FOR SALE

1—22" x 60" Farrel 2 roll mill 150 HP.
1—4½" extruder, NRM, 40 - 30 HP.
1—4' x 12' vulcanizer, Q. O. door.
1—6" x 12" Adamson combination mill and calender unit.

CHEMICAL & PROCESS MACHINERY CORP.
52 9th Street
Brooklyn 15, N. Y. Phone HY 9-7200

MACHINERY FOR SALE

WILL SACRIFICE BEFORE REMOVAL

GOOD OPERATING CONDITION—CAN BE INSPECTED UNDER POWER

60" H.D. Mills—22" centers—14" W.C. full bronze bearings
36" H.D. Refiners—22" centers—14" W.C. full bronze bearings
36" H.D. Crackers (corrugated rolls)—14" W.C. full bronze bearings
40" x 140" Simpson Shaker
#S-40 60 Sutton Stoner
12" Allen Strainer
36" and 57" Rubber Splitting Machines

(ALL ABOVE AVAILABLE WITH OR WITHOUT DRIVES AND MOTORS)

2—5' x 54' VULCANIZERS—250# W.P. ASME CODE—quick opening doors

CONSOLIDATED METAL PRODUCTS CORP.
430 W. Ontario St., Philadelphia 40, Pa.
Phone: NEBRASKA 4-3051

1—36 x 36" 2-opening press, 22" ram
1—36 x 36" Farrel steel press, 18" ram
1—36 x 36" Farrel steel press, 16" ram
1—30 x 30" Southwark Side Slab, 20" ram
22 x 22 x 60" Farrel mills with new rolls complete
#1, #2, #3 and #4 Royle extruders
New 6 x 13" RELIABLE Laboratory Mills

Various size rubber mills and presses in stock.
We specialize in rebuilding rubber and plastic machinery.
We now have the largest facilities in the East for dismantling, rebuilding and assembling rubber and plastic machinery.
Buying and Selling.

Reliable
RUBBER & PLASTIC MACHINERY CO., INC.
2014 UNION TURNPIKE NORTH BERGEN, N. J.
PHONE: UNION 5-1073

LIQUIDATION SALE

USED MACHINERY FOR RUBBER AND PLASTICS

All sales on "As Is, Where Is" basis
from the Akron, Ohio,
and Trenton, N. J., warehouses of

L. ALBERT AND SON
DIVISION BELLANCA CORPORATION

Mixing Mills	Pumping Units
Extruders	Vulcanizers
Calenders	Spreaders
Presses	Tubers
Spare Parts	Other Equipment

Call or Write

BELLANCA CORPORATION
219 E. Hanover Street, Trenton, New Jersey
Phone: OWen 5-6356
258 Kenmore Boulevard, Akron, Ohio
Phone: BLackstone 3-6107

TOP VALUE BUYS

1242 ton Farrel twin ram press, 80" x 48" upmoving platen, two 23" rams.

Banbury #3A mixer, priced right before removal.

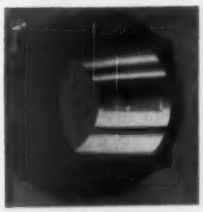
Banbury #3 complete with 75 hp M. D.

Accumulator—complete low pressure system. 700 PSI, 10 air bottles, two 100 hp pumps. Late type.

Terms Available. We Will Finance.

JOHNSON MACHINERY CO.
679 Frelinghuysen Ave.
Newark, New Jersey
Bigelow 8-2500
What do you need? What have you to sell?

HEAVY RUBBER & PLASTIC MACHINERY



Rebuilt Bearing . . . part of N.E.E. Service

- Rebuilt
- Installed
- Repaired

Complete job done right in your plant. No supervision required. 30 years experience in servicing mills, mixers, calenders, tubers, etc.

Metal spraying jobs welcomed. Used equipment bought and sold.

WRITE — WIRE — PHONE TODAY

New England Engineering Co., Inc.
P.O. Box 465, Derby, Conn. REgent 4-1433

AKRON RUBBER MACHINERY CO., INC.

200 South Forge St., Akron 9, Ohio, Phone HEmlock 4-9141

We are one of the foremost specialists in supplying everything in used, reconditioned, and new machinery for the Rubber and Plastics industries only.

ARMACO

NEW—Laboratory mills, hydraulic presses, extruders, bale cutters, and vulcanizers. We are interested in purchasing your surplus machinery or complete plant.

HOWE MACHINERY CO., INC.

30 Gregory Avenue — Passaic, N. J.

DESIGNERS & BUILDERS
OF "V" BELT MANUFACTURING EQUIPMENT

Cord Latexing, expanding mandrels, automatic cutting, skiving, flipping and roll drive wrapping machines.

ENGINEERING FACILITIES FOR SPECIAL EQUIPMENT

Call or Write

Do you have used rubber machinery for sale?

HOUSTON RUBBER MACHINE COMPANY

3301 Jensen Drive, Houston 26, Texas

Let Us Know Your Needs

How to Keep POSTED

In rubber, there's an easier way. Be sure to have your own subscription to RUBBER AGE and you won't have to wait weeks for the plant copy to reach you.

RUBBER AGE is such an important tool of your business, you should get maximum value from every issue . . . and that means seeing it while it is still current!

Fill in and mail the coupon below. Do it today, now, while it's fresh in your mind.

RUBBER AGE, 101 West 31st St., New York 1, N. Y.

Please enter my subscription to RUBBER AGE, starting with the next issue, for:

☐ One Year $5, ☐ Two Years $7.50, ☐ Three Years $10
☐ Payment Enclosed ☐ Bill Me ☐ Bill My Company

Note: Add 50c per year for Canadian subscription and $1.00 per year for foreign subscription.

Name ..... Title .....

Company .....

☐ Home or ☐ Office Address .....

City ..... Zone .... State .....

1258

NEW CONCEPT

in calender and mill frame construction — frames of fabricated steel weldments — lifetime guarantee — new machines built in any size

Guaranteed
NEW · USED · REBUILT MACHINERY
21 SHERMAN ST. • WORCESTER, MASS.

DIVISION OF BOWKER BROTHERS OF MASS. INC.
SHERMAN RUBBER MACHINERY CO.

RMP

ANTIMONY FOR RED RUBBER

- ATTRACTIVE
- NON-DETERIORATING

RARE METAL PRODUCTS CO.
ATGLEN, PA.

ALL STEEL, ALL WELDED CONSTRUCTION, with forged steel hubs for 1¼", 1½" and 2" square bars. 4", 5", 6" 8", 10", 12", 15", 20" and 24" diameters. Any length.

Also Special Trucks, Racks, Tables and Jigs, Used in manufacturing rubber and plastic products.

THE W. F. GAMMETER COMPANY
CADIZ, OHIO

Index to Advertisers

Adhesives Age 426, 475
Aetna-Standard Engineering Co. 389
Akron Rubber Machinery Co. 532
Allied Chemical Corp. 396
American Cyanamid Co.
Rubber Chemicals Dept. 509
American Hard Rubber Co. 529
Ames, B. C., Co. 496
Amoco Chemicals Corp. 401
Anic-S.p.A. 423

Bellanca Corp. 531
Bestread Products Co. 529
Bolling, Stewart, & Co., Inc. 527
Borden Co., Chemical Div. 529
Borg-Warner Corp., Marbon Chemical Div. 385

Cabot, Godfrey L., Inc. 427
Cadillac Associates, Inc. 529
Carter Bell Manufacturing Co. 406
Cary Chemicals, Inc. 511
Chemical & Process Machinery Corp. 531
Chemical Publishing Co., Inc. ..... —
CLASSIFIED ADVERTISING 528-32
Cleveland Liner & Manufacturing Co. 380
Columbian Carbon Co. ..... Insert 463-64
Consolidated Metal Products Corp. 531
CONSULTANTS SECTION 530
Continental Carbon Co. 399
Copolymer Rubber & Chemical Corp. ..... Insert 411
Cumberland Engineering Co., Inc. 410

D. P. R. Inc. 496
Darlington Chemicals, Inc. 495
Davis-Standard Div., Franklin Research Corp. 379
Day, J. H., Co. 498
Diamond Alkali Co. 390
Disco, Inc. 530
Dow Corning Corp. 424-25
Drake Personnel, Inc. 529
du Pont de Nemours, E. I. & Co., Inc.
Elastomer Chemicals Dept. ..... Second Cover
Durez Plastics Div., Hooker Chemical Corp. 388

Eagle-Picher Co. 500
Eastman Machine Co. 523
Endura Corp. 490
English Mica 530
Enjay Co., Inc. ..... Insert 391-94
Erie Engine & Mfg. Co. 521

Farrel-Birmingham Co., Inc. 419
Franklin Research Corp., Davis-Standard Div. 379

Gammeter, W. F., Co. 532
General Electric Co. ..... 480; Insert 481-82, 528
General Tire & Rubber Co., Chemical Div. 489
Genseke Brothers 374
German-American Trade Promotion 521
Gidley, Philip Tucker 530
Goodrich, B. F., Chemical Co. 373
Goodrich-Gulf Chemicals, Inc.
Ameripol 378
Carbon Black 417
Goodyear Tire & Rubber Co.
Chemical Div. ..... Insert 381-82; 383
Gummi und Asbest ..... —

Hale & Kullgren, Inc. 389; 530
Hall, C. P., Co. 503
Harwick Standard Chemical Co. ..... Fourth Cover
Hoggson & Pettis Manufacturing Co. 523
Holliston Mills, Inc. 525
Hooker Chemical Corp. 388
Holmes, Stanley H., Co. 494
Houston Rubber Machine Co. 532
Howe Machinery Co., Inc. 532
Huber, J. M., Corp. 377

Independent Die & Supply Co. 499
Institution of the Rubber Industry 504

Johnson Machinery Co. 531
Johnson Steel & Wire Co., Inc. 402-03

K. B. C. Industries, Inc. 529
Kautschuk und Gummi ..... —

La Goma ..... —
Litzler, C. A., Co., Inc. 501

Marbon Chemical Div., Borg-Warner Corp. 385
Martin Rubber Co., Inc. 529
Monsanto Chemical Co. 405; 519
Muehlstein, H., & Co., Inc. 407

National Aniline Div., Allied Chemical Corp. 396
National Rosin Oil Products, Inc. 530
National Rubber Machinery Co. 487
Naugatuck Chemical Division,
U. S. Rubber Co. 430; 485
Nelson Employment Service 529
Neville Chemical Co. 483
New England Engineering Co., Inc. 531

Olin, R. R., Laboratories 530
Ozone Research & Equipment Corp. 525

Palmore Laboratories, Inc. 530
Petro-Tex Chemical Corp. 412
Phillips Chemical Co. 336-87
Pittsburgh Steel Co. 402-03
Polymel Corp. 429
Pure Carbonic Co. 404

Rare Metal Products Co. 532
Reliable Rubber & Plastic Machinery Co. 531
Revue Générale du Caoutchouc ..... —
Rhodia, Inc. 497
Richardson, Sid, Carbon Co. 534
Ross, J. O., Engineering Div.,
Midland-Ross Corp. 513
Royle, John, & Sons 473
Rubber Age Circulation 532
Rubber Corp. of America 498
Rubber Journal ..... —

Sargent's, C. G., Sons Corp. 501
Schaefer Machine Co., Inc. 495
Schulman, A., Inc. ..... Third Cover
Scott Testers, Inc. 506
Scovill Manufacturing Co. 491
Shaw, Francis & Co., Ltd. 400
Shell Chemical Corp., Synthetic Rubber
Sales Div. 414
Sherman Rubber Machinery Co. Div. 532
Skelly Oil Co. 515
Snell, Foster D., Inc. 530
South Florida Test Service 530
Spadone Machine Co. 408
Stamford Rubber Supply Co. 523
Stauffer Chemical Co., Inc. 507
Stoner's Ink Co. 530

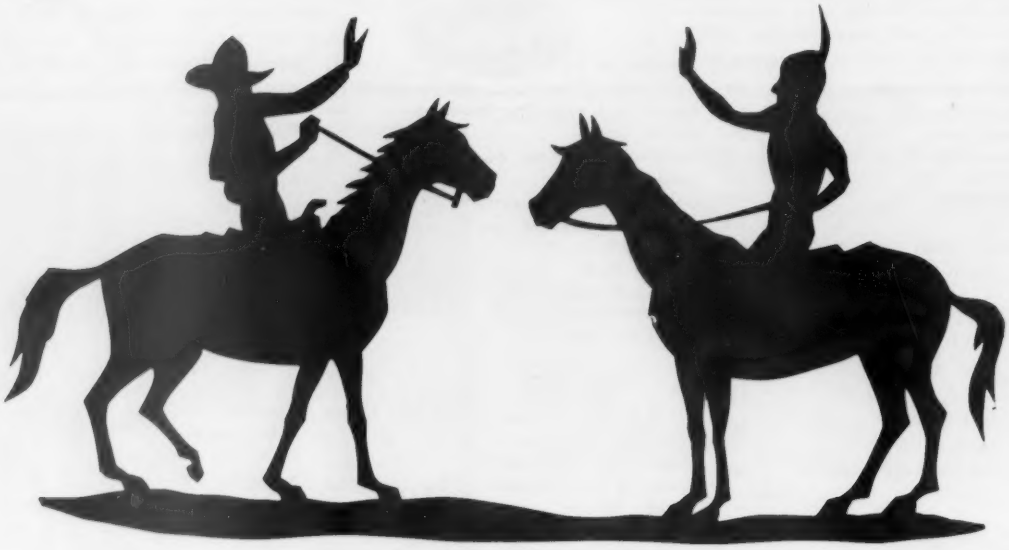
Taylor Instruments Companies 413
Texas-U. S. Chemical Co. ..... Insert 492-3
Thiokol Chemical Corp. 505
Titanium Pigment Corp. 418
Trade News Service ..... —

United Carbon Co., Inc. ..... Insert 421-22
United Clay Mines Corp. 499
U. S. Rubber Co., Naugatuck
Chemical Div. 430; 485
Universal Oil Products Co. 409
Utility Manufacturing Co. 490

Vanderbilt, R. T., Co. ..... Front Cover

Wellington Sears Co. 517
Witco Chemical Co. 399

HUGHES PRINTING CO.
EAST STROUDSBURG, PA.



...friendship

Friendship between supplier and customer is of paramount importance. As we come to the end of another year we are grateful for the friendship and confidence our customers have shown in us.

To all we extend cordial greetings for the Holiday Season.

TEXAS
CHANNEL BLACKS
®

Sid Richardson
CARBON CO.
FORT WORTH, TEXAS

GENERAL SALES OFFICES
EVANS BUILDING
AKRON 8, OHIO

Season's
GREETINGS!
A. Schulman Inc.
Rubber and Plastics
AKRON, OHIO • NEW YORK, N. Y. • BOSTON, MASS. • CHICAGO, ILL.
E. ST. LOUIS, ILL. • LOS ANGELES, CALIF. • LONDON, ENGLAND • HANOVER, GERMANY

Call your HARWICK man

Your Harwick man often can anticipate problems before they start, and suggest appropriate remedies. He is technically trained, with wide experience in the closely related plastics and rubber industries. Call him in; he's as close as your phone.

From accelerators to resins, from colors to nutshell flour, Harwick Standard Chemical Company can supply your needs for most compounding materials. Save time by ordering from this single source.

your source for:

- COLORS
- PLASTICIZERS
- ACCELERATORS
- SYNTHETIC RESINS
- AND ALL OTHER COMPOUNDING MATERIALS FOR RUBBER AND PLASTICS

If You Would Like to Receive HARWICK Technical Bulletins, Write to:

Harwick Technical Representatives

AKRON, STadium 4-0481:
H. G. Greer — *K. H. Irons*
J. W. Shrontz — *C. R. Simpson*

ALBERTVILLE, 1485:
A. Koper

BOSTON, COpley 7-1860:
J. H. Fitz Gerald — *C. A. Meyer*

CHICAGO, LOngbeach 1-3195:
G. R. Hubn — *A. L. Robinson*

GREENVILLE, CEdar 5-0871

LOS ANGELES, MAdison 7-8588:
D. C. Maddy — *H. A. Trechter*

TRENTON, JUniper 7-0300:
R. J. Salyerds — *J. L. Weaver*

HARWICK STANDARD CHEMICAL CO.

60 SOUTH SEIBERLING STREET AKRON 5, OHIO

ALBERTVILLE, ALA. OLD GUNTERSVILLE HWY • BOSTON 16, MASS. 661 BOYLSTON ST • CHICAGO 25, ILLINOIS 2724 W. LAWRENCE AVE • GREENVILLE, S.C. P.O. BOX 746 • LOS ANGELES 21, CALIF. 1248 WHOLESALE STREET • TRENTON 9, N.J. 2595 E. STATE ST

42nd YEAR

Rubber Age

COVERING THE MANUFACTURE OF RUBBER AND RUBBERLIKE PLASTICS PRODUCTS

JANUARY, 1959

Annual Review and Preview

an editorial appraisal of the rubber industry as it enters the new year . . . see page 597

means just that

AGERITE* Antioxidants

Protect rubbers from deterioration in practically every type of service.

AGERITE* SUPERFLEX

Recommended as a stabilizer in SBR manufacture, and general purpose antioxidant for tires, molded goods and belts of all rubbers.

*U. S. Registered Trademark